Nevada Strategic Action Plan 2016

For Implementation of the 2014 Nevada Greater Sage-grouse Conservation Plan

Prepared by the Nevada Sagebrush Ecosystem Technical Team

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Admin Draft

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List of Acronyms

AML	Appropriate Management Level
ARMPA	Approved Resource Management Plan Amendment
BSU	Biologically Significant Units
BLM	Bureau of Land Management
CCS	Nevada Conservation Credit System
CD	Conservation District
COT	Conservation Objectives Team
CPT	Conservation Planning Tool
CRBI	Conifer Removal Benefits Index
DPS	Distinct Population Segment
EIS	Environmental Impact Statement
FIAT	Fire and Invasives Assessment Tool
GRSG	Greater Sage-grouse
HQT	Habitat Quantification Tool
LAWG	Local Area Working Group
LUPA	Land Use Plan Amendment
LSR	Landscape Scale Restoration
MOU	Memorandum of Understanding
NAIP	National Agriculture Imagery Program
NDA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NRCS	Natural Resources Conservation Service
P-J	Pinyon-Juniper
PMU	Population Management Unit
ROD	Record of Decision
R&R	Resilience and Resistance classifications
SEC	Sagebrush Ecosystem Council
SEP	Sagebrush Ecosystem Program
SETT	Sagebrush Ecosystem Technical Team
SGMA	Sage-grouse Management Area
USFS	United States Forest Service
USGS	United State Geological Survey
USFWS	United States Fish and Wildlife Service
WERC	Western Ecological Research Center
WHB	Wild Horse and Burro

1.0 INTRODUCTION

The Nevada Sagebrush Ecosystem Program (SEP) was established with the formation of the Sagebrush Ecosystem Council (SEC) and the Sagebrush Ecosystem Technical Team (SETT). Established under Executive Order 2012-19 by Governor Brian Sandoval in 2012, and legislatively authorized in 2013, the SEC is a collaborative body of representatives from conservation and environmental interests, the energy industry, agricultural interests, ranching, mining, local government, and Native American Tribes. The SEC, in conjunction with the State and federal natural resource agencies, is responsible for making policy decisions and overseeing the operations of the SETT and the Nevada Conservation Credit System (CCS). The SETT is a multidisciplinary team, which includes staff from the Nevada Department of Wildlife (NDOW), the Nevada Department of Agriculture (NDA), the Nevada Division of Forestry (NDF), and the Nevada Division of State Lands (NDSL) that collaborates with the State and federal partners on management strategies, habitat mapping, and restoration of the State's sagebrush ecosystems.

In 2014 under the direction of the SEC, the SETT produced the Nevada Greater Sage-Grouse Conservation Plan (State Plan). The State Plan set a balanced foundation and vision for a coordinated management approach to conserve GRSG and sagebrush ecosystems in Nevada by defining the following goals:

- ***Due to the broad reach of sage-grouse habitat, effective management and implementation of sage-grouse conservation actions must be conducted through a collaborative, interagency approach that engages private, non-governmental, local, state, Tribal, and federal stakeholders to achieve sufficient conservation of sage-grouse and their habitat.***

- ***Monitoring and adaptive management will be employed at all levels of management in order to acknowledge potential uncertainty upfront and establish a sequential framework in which decision making will occur in order to learn from previous management actions.***

This Strategic Action Plan (SAP) is a companion document to the 2014 State Plan and outlines how the State Plan will be implemented. Using known tools and the best available science, the SETT will provide overall guidance and assistance to address known threats of significance identified within the NDOW Greater Sage-grouse (GRSG) Planning Areas to further refine and prioritize management and conservation actions (Figure 1). The purpose of this SAP is to provide local agencies, governments, organizations, and stakeholders with a comprehensive framework to assist them in planning efforts to identify projects goals and objectives, prioritize rehabilitation, restoration and conservation efforts, and guide best management practices in order to improve habitat quality of the sagebrush ecosystem to support and increase GRSG populations within the State of Nevada. The desired outcome of the SAP is to provide tools and guidance to address the four long-term strategic goals of the SEP. The four strategic goals are:

1. **Participation in local area threat assessments and assist in the development of action plans to prioritize and address threats and to encourage enrollment of effective credit projects in the Nevada Conservation Credit System as applicable.**

2. **Substantially reduce or eliminate potential threats to Greater Sage-grouse populations and habitats.**

3. **Continued implementation and refinement of the Nevada Conservation Credit System to mitigate direct and indirect impacts of anthropogenic disturbances and assure net conservation gain for Greater Sage-grouse habitat.**

4. **Exchange of information on a regular basis to expand the scientific knowledge of sagebrush ecosystems, reduce the uncertainty of management decisions, and accomplish successful conservation.**

To achieve these goals, one of the primary duties of the SETT is to lead a coordinated interagency and stakeholder approach to successfully implement this SAP. Involved agencies and stakeholders will include the State and federal agencies, local government, Local Area Working Groups (LAWGs), Conservation Districts (CDs), Tribal Nations, private landowners, resource managers, and other interested parties.

This SAP is organized into the following Sections:

- *Section 2.0 Action Plan* – Outlines strategic actions that address each of the four strategic goals identified by the SEP.

- *Section 3.0 Project Toolbox* – Provides information on funding resources and project assessment tools to assist local entities and landowners with resources to fund and evaluate projects to maintain intact, functioning sagebrush ecosystems in Nevada.

- *Section 4.0 Planning Area Prioritization and Implementation Guidance* – Provides LAWGs, counties, landowners, and other local working or planning groups with specific information within the GRSG Planning Areas to use in combination with the Project Toolbox for project implementation.

This SAP will be updated and amended as new available science emerges and lessons are learned through implementation of the SAP. Annual updates on activities and implementation of the actions herein this plan will allow the SETT to modify this SAP based on project accomplishments, new research developments, partner contributions, and public policies. The SETT will collaborate with all project partners in the appropriate capacity to promote sound, science based management decisions to benefit GRSG and sagebrush ecosystems in Nevada.

2.0 ACTION PLAN

2.1 Maintain and Improve Stakeholder Involvement

Goal: Participate in local area threat assessments and assist in the development of action plans to prioritize and address threats and to encourage enrollment of effective credit projects in the Nevada Conservation Credit System as applicable.

The State Plan describes the most significant threats to GRSG in Nevada as habitat loss from wildfire, invasive plants (principally cheatgrass), and P-J encroachment. Threats to GRSG within individual population management units (PMU) or biologically significant units (BSU) are variable and site-specific. Evaluation of current and potential threats to GRSG and its habitat is a product of assessing the interactions of local area conditions. The BSU/PMU threat assessment is most appropriately conducted at the local level and should incorporate existing data, local knowledge of GRSG populations, existing land uses, and local expertise on the landscape. The SETT will provide technical assistance and facilitate local involvement in the threat assessment process, evaluate actions to address verified threats, and explore the potential to enroll qualifying projects into the CCS.

2.1.1 Effective Communication, Collaboration, and Project Planning

Potential partners and contributors: SEP, BLM, USFS, NDOW, NDA, NCRS, LAWGs

The State will assist in the facilitation of effective communication and information sharing through existing agreements that commit the State and federal agencies to collaborate via the SEP in order to conduct agency updates on plan implementation, review and interpret monitoring data, develop annual work plans, make adaptive management decisions, and maintain accountability for implementation of the State Plan.

Action 2.1.1-1 Adopt guidelines as set forth in the final draft concept paper: Nevada Collaborative Public Lands Management Structure for Implementation of U.S. Forest Service (USFS) and Bureau of Land Management (BLM) Records of Decision for Greater Sage-Grouse Land Use Plans. This draft concept paper outlines a collaborative structure comprised of three administrative levels that incorporate State, federal, and local participation to address and implement actions and policies defined in the RODs.

Action 2.1.1-2 Evaluate the potential to develop a *Service First Agreement*, as authorized by USC 43, Chapter 35, Subchapter I §1703, which allows the Secretaries of the Interior and Agriculture the authority to establish programs involving certain land management agencies to conduct activities jointly or on behalf of one another; make reciprocal delegations of their respective authorities, duties, and responsibilities; and transfer funds and reimburse funds on an annual basis, including transfers and reimbursements for multi-year projects.

Action 2.1.1-3 Collaborate with stakeholders to assist in the establishment of criteria for prioritization of conservation efforts in order to achieve landscape-scale conservation of GRSG and the sagebrush ecosystem based on localized threats and local area conditions using available technical tools, maps, models, handbooks, and guides (e.g. Resistance and Resilience, State and Transition, P-J mapping, Ecological Site Descriptions, Fire and Invasives Assessment Tool, etc.) and others as they become available.

Action 2.1.1-4 Collaborate with the State and federal agencies to establish a planning strategy to maximize conservation efforts of sagebrush ecosystems in Nevada and assist to identify and enable an exchange of information regarding multi-jurisdictional funding opportunities available to assist LAWGs, resource managers, private landowners, and other interested parties in supporting local management or conservation projects.

2.1.2 BSU-Level Threat Assessment

Potential partners and contributors: LAWGs, CDs, Cooperative Weed Management Area groups, SEP, NDOW, NDA, BLM, USFS, USFWS, Tribal Nations, Other Stakeholders

Action 2.1.2-1 Assist CDs and LAWGs to engage and inform stakeholders by providing technical tools and expertise, maps, and other geographical information and data to compile data on existing habitat conditions, GRSG abundance, and threat assessments at the BSU/PMU level.

Action 2.1.2-2 Provide information to LAWGs regarding debit projects within proximity of planning areas that require the purchase of mitigation credits from the CCS to encourage the development and possible enrollment of credit projects in the CCS.

Action 2.1.2-3 Explore opportunities to provide funding to assist the formation of local area working or planning groups.

Action 2.1.2-4 Assist LAWGs and CDs to prioritize enhancement, restoration, fuel reduction, and mitigation projects to improve their qualifications for enrollment in the CCS.

Action 2.1.2-5 Assist LAWGs and CDs in applying for funding to implement plans and to explore opportunities to maximize conservation implementation by incorporating funding from other agencies or partners.

2.2 Minimize and Eliminate Threats

Goal: Substantially reduce or eliminate potential risks to Greater Sage-grouse populations and habitats.

2.2.1 Wildfire

Potential partners and contributors: SEP, NDF, BLM, USFS, NRCS

In many areas in Nevada, wildfire in conjunction with invasive annual grasses and accumulating woody fuel from trees and shrubs represents the greatest threats to GRSG populations (SEP 2014, USFWS 2013). This presents opportunities for the State and federal fire agency coordination of pre-suppression and suppression, and wildfire restoration

Action 2.2.1-1 Facilitate collaboration among the State and federal fire agencies, CD Staff, LAWGs and private landowners to design, implement, and maintain effective fuel reduction treatments and fuel breaks based on best available science to protect GRSG habitat in Sage-grouse Management Areas, as well as to maintain functional acres on credit projects and reduce risks to areas with low resistance and resilience.

Action 2.2.1-2 Compile and submit annual progress reports and maps to the SEC to review the progress being made to reduce the threat of hazardous fuel conditions and to inform future project collaboration and implementation.

Action 2.2.1-3 Support prioritizing fire suppression actions, fire rehabilitation efforts, and fuels treatments to minimize sagebrush habitat loss or type conversions in and immediately adjacent to known occupied and potential GRSG habitat. Utilize the GRSG habitat matrix based on resilience and resistance concepts as a prioritization tool (Chambers et al. 2014).

Action 2.2.1-4 Participate and coordinate meetings with State and federal fire agencies and private landowners to prioritize post-fire restoration treatments in order to achieve GRSG habitat objectives. Use the concepts of resistance and resilience (R&R) and the Fire and Invasives Assessment Tool (FIAT) to pre-plan fire rehabilitation goals and treatments in GRSG Management Areas to enable rapid implementation of appropriate treatments following wildfire. Modify plans on a case-by-case basis as necessary to incorporate annual climatic variability or in response to seed and plant material availability.

Action 2.2.1-5 Identify grant opportunities and other programs such as SGI, USFS, State, Private Forestry Landscape Scale Restoration (LSR) grants, and USFWS Partners Program to expand and leverage available funding for fuel reduction treatments and fuel breaks implementations in GRSG Management Areas.

Action 2.2.1-6 Collaborate with the NDF seed bank and native plant nursery managers to implement a native species seed bank program and conduct seed collections to insure the availability of locally adapted seed for fire rehabilitation efforts in important GRSG habitat.

Action 2.2.1-7 Collaborate with NDF to periodically update relevant data layers for inclusion within the NDF Forest and Fire Information Portal; collaborate to ensure reliable and current information related to wildfire protection and post-fire restoration priority areas is easily accessible via the portal.

Action 2.2.1-8 Participate on the NDF Resource Advisory Council.

2.2.2 Invasive Species

In many areas in Nevada, invasive annual grasses in conjunction with wildfire represents one of the greatest threats to GRSG in Nevada and can result in long-term or permanent conversion of sagebrush habitat to unsuitable conditions (SEP 2014, USFWS 2013). Effective eradication or preventative efforts to reduce the spread of invasive and noxious plants must be a collaborative effort across all land ownerships and jurisdictions using an integrated pest management approach that incorporates the use of traditional methods for treatment and biological controls.

Potential partners and contributors: SEP, NDA, BLM, USFS, NRCS, NDF, Counties

Action 2.2.2-1 Require systematic and strategic detection surveys, mapping, treatment, and monitoring noxious weeds for projects enrolled in the Nevada CCS. Coordinate with the Nevada Department of Agriculture (NDA) to utilize the EDD MapS database, or other databases approved by NDA, as a central repository to maintain all records of noxious weed occurrences and treatments.

Action 2.2.2-2 Explore opportunities to fund local groups (e.g. Cooperative Weed Management Areas, Weed Districts, LAWGs, CDs) to conduct mapping, treatment, and monitoring of noxious weeds. Prioritize funding to these groups for areas within GRSG Management Areas. Require annual reporting to NDA through the NV EDD MapS database.

Action 2.2.2-3 Require project proponents of land disturbing activities enrolled in debit projects in the CCS to monitor and treat noxious weeds annually and report all findings to the NV EDD MapS database and to the SEP.

Action 2.2.2-4 Collaborate with local groups in conducting field trials for experimental biological agents or large-scale treatments using recently approved biological control methods.

Action 2.2.2-5 Assist in the creation of locally cultivated or collected native seed sources and the development of market conditions that are conducive to the annual production and collection of those seeds.

2.2.3 Pinyon-Juniper Encroachment

Potential partners and contributors: SEP**,** BLM, USFS, NDF, NRCS, Private Land Owners

Encroachment of pinyon and juniper (P-J) into sagebrush communities ranks as the third greatest risk to GRSG in Nevada. The continuing expansion of P-J contributes to the loss of important seasonal habitats and increases raptor presence and predation (Commons et al. 1999). Studies have demonstrated that no active leks remain when P-J canopy cover exceeds 4% (Baruch-Mordo et al. 2013) and experience increased risk of mortality due to increased movement through P-J (Prochazka et al. In Review).

Action 2.2.3-1 Support the use of the Habitat Quantification Tool (HQT), the FIAT, NRCS, BLM, the Conservation Planning Tool (CPT) developed for the Bi-State Distinct Population Segment (DPS), and U.S. Geological Survey (USGS) P-J mapping tools for prioritizing areas of P-J removal in Sage-grouse Management Areas (SGMAs) to maximize benefits to GRSG habitat from treatments.

Action 2.2.3-2 Identify grant opportunities and other programs such as SGI, State and Private Forestry LSR grants, and USFWS Partners Program to expand and leverage available funding for P-J removal treatments in SGMAs and encourage enrollment of these projects in the CCS.

Action 2.2.3-3 Promote the NDF Biomass Utilization and Management Program, as well as other State initiatives such as the P-J Partnership that incentivize and assist with development of bio-fuels, biochar, and other commercial uses of P-J biomass from treatment projects to improve the economic viability of P-J removal to restore sagebrush ecosystems.

Action 2.2.3-4 Encourage LAWGs and private landowners planning to conduct P-J treatments on private property to coordinate with federal land managers to maximize efforts to expand P-J treatment projects and effectiveness related to GRSG habitat improvements.

Action 2.2.3-5 Require P-J projects enrolled in the CCS to monitor treatments to evaluate the effects of P-J removal on recruitment of P-J seedlings and require maintenance of treatment area to prevent re-establishment of conifers.

Action 2.2.3-6 Participate on the NDF Resource Advisory Council.

2.2.4 Infrastructure and Human Disturbance

Potential partners and contributors: BLM, USFS, NDF, NRCS, Private Land Owners

The State will implement site-specific conservation measures to minimize or eliminate risks associated with existing infrastructure and human disturbance.

Action 2.2.4-1 Support recommendations and action items described in the State Plan and the Site Specific Consultation Based Design Features to avoid, minimize, or mitigate anthropogenic disturbances within a project area.

Action 2.2.4-2 Provide technical planning assistance to disturbance project proponents to work towards avoiding impacts to GRSG habitat as the preferable option or minimizing impacts when avoidance is not feasible. Projects that will require mitigation of impacts should be evaluated for qualification to enter the CCS.

2.2.5 Other Habitat Improvement and Restoration

Potential partners and contributors: BLM, USFS, NDF, NRCS, Private Land Owners

Intent of this activity is to recognize there are other identified impacts within the State Plan that the State at this time is limited in its capacity to manage but can participate in cooperation with its State and federal partners. Review of actions in the State Plan within the grazing, predation and WHB management sections is recommended when developing management plans.

Action 2.2.5-1 Support, promote, and facilitate full implementation of the Wild Free-Roaming Horses and Burros Acto of 1971, and management decisions and guidelines outlined within the BLM and USFS Land Use Plan Amendments (LUPA) to manage to appropriate management levels (AML) of free-ranging wild horses and burros (WHB) within SGMAs.

Action 2.2.5-2 Predators: Support implementation of the NDOW Predator Management Plan and Management Actions described in the State Plan to reduce anthropogenic subsidies and threats from raven depredation on GRSG nests (NDOW 2016b).

Action 2.2.5-3 Grazing: Support proper livestock grazing management strategies and Management Actions to maintain or improve GRSG habitat conditions within SGMAs as described in the BLM and USFS LUPAs and the State Plan.

2.3 Conservation Credit System

Goal: C*ontinued implementation and refinement of the Nevada Conservation Credit System to mitigate direct and indirect impacts of anthropogenic disturbances and assure conservation benefits for Greater Sage-grouse habitat.*

The CCS was developed to meet regulatory requirements established by State of Nevada statute NRS Chapter 232.162 to fulfill compensatory mitigation requirements for anthropogenic disturbances to GRSG habitat on BLM and USFS lands in Nevada. The CCS is used to offset impacts from anthropogenic disturbances[1] through habitat enhancement and protection that results in a *net conservation benefit* for GRSG habitat in Nevada. The CCS quantifies verified functional habitat value in the form of credits and quantifies the verified functional habitat value of impacts, both direct and indirect, in the form of debits.

The CCS fulfills Presidential Memorandum (November 3, 2015)[2] directive to ensure that federal policies are clear, work similarly across agencies, and are implemented consistently. The CCS meets the objective of encouraging private investment to achieve public natural resource conservation as an innovative way to finance successful stewardship and restoration projects that demonstrate a measurable net conservation gain of sagebrush habitat in Nevada.

The CCS is designed to accommodate public land credits in the system and the State Plan currently allows for credits to be generated on public land. However, procedures and instructions have not been fully conceived or adopted for federal agency engagement with the CCS to verify and enroll credits on public land.

2.3.1 Credit System Enrollment

The intent of this goal is to encourage and promote participation of potential credit developers and buyers in the CCS to achieve a net conservation benefit for GRSG habitat.

Potential partners and contributors: SEP, BLM, USFS, credit developers and buyers

Action 2.3.1-1 Execute a Memorandum of Understanding (MOU) with the BLM and USFS that creates a documented process to create and enroll public land credits into the Nevada CCS.

[1] Livestock operations and agricultural activities and infrastructure related to ranch and farm businesses (e.g. water troughs, fences, etc.) are not included in this definition of debit project types. Section 7.5 and Appendix A of the 2014 Nevada Greater Sage-Grouse Conservation Plan address how to minimize impacts to greater sage-grouse and their habitat from these activities.

[2] Presidential Memorandum: *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment.* November 3, 2015.

Action 2.3.1-2 Participate in the Nevada Collaborative Public Lands Management Structure to demonstrate a collaborative, bottom-up approach to implementation of the ARMPA and other public land initiatives. Use the structure to expand local planning with stakeholder involvement and to improve the process for verification and enrollment of public land credits into the Nevada CCS.

Action 2.3.1-3 Expand credit developer enrollment in the Nevada CCS and facilitate fulfillment of the Presidential Memorandum through signed agreements with the BLM and USFS that define the collaborative processes for using the Nevada CCS to create and enroll credits on public lands in Nevada.

2.3.2 CCS Education and Training

Potential partners and contributors: SEP

Expand enrollment of credit and debit projects in the Nevada CCS through ongoing training and continuing education of credit system verifiers, private landowners, industry stakeholders, and tribes on the Nevada CCS and the HQT.

Action 2.3.2-1 Schedule and conduct basic and advanced training sessions throughout the State to establish a pool of qualified credit/debit verifiers.

Action 2.3.2-2 Conduct informational presentations at annual stakeholder meetings, public meetings, and other opportunities to expand the general understanding of the Nevada CCS and provide opportunities for one-on-one engagement of potential credit/debit developers with SETT experts.

Action 2.3.2-3 Expand the use of the internet and other media outlets (e.g. news releases, YouTube videos, social media, newsletters, etc.) to keep stakeholders and federal agencies abreast of State accomplishments and findings regarding the Nevada CCS.

2.3.3 CCS Conservation Effectiveness

Potential partners and contributors: SEP

Continue to evaluate the conservation effectiveness of the CCS and identify recommendations for improvement of the CCS Manual and User's Guide through adaptive management processes.

Action 2.3.3-1 Develop and oversee a monitoring and adaptive management program to provide recommendations to the SEC on how to update policies based on new available information.

Action 2.3.3-2 Implement 2016 SEC recommendations for continual improvements resulting from findings of the adaptive management program.

- Site-scale Data Collection Improvements - Utilize large data sets now available from the initial credit and debit projects to determine if field data parameters can be improved to increase replicability and statistical confidence in results.
- Credit Validations - Develop site-specific, objective-based performance measures to ensure transparency and accountability while increasing confidence of Credit Developers that decisions on remediation and credit invalidation will be based on clearly-defined and objective measures of site performance.
- Sample Timing - Provide guidelines for when field data can be collected relative to grazing activities to ensure field data is appropriate for calculating habitat function for the site. This guideline will also provide consideration for sampling in drought conditions.
- Minimization Incentives - Determine methods and objectives to modify disturbance decay curves when minimization actions are implemented.
- Variance Protocol - Define clear steps to come to an accepted variance to existing CCS policy and application of the HQT, which will likely include the SEC approval for all variances.
- HQT Functionality Enhancement - Create GIS models that automate application of the HQT and thus increase the accuracy and consistency of the HQT.
- Fee Structure - Establish a fee structure that appropriately covers, either partially or wholly, CCS administrative costs.
- Verifier Policies - Differentiate and provide more specific requirements of verification processes and more clearly define rules for hiring verifiers to provide participants and Verifiers certainty and ensure credibility of the CCS.
- Public Lands Credit Development - Define a process that satisfies public land manager requirements for mitigation on public lands.
- Refine base-line scoring by using the expanding data sets to identify baseline conditions at the ecological site or disturbance response group.

2.4 Research and Monitoring

Goal: Exchange of information on a regular basis to expand the scientific knowledge of sagebrush ecosystems, reduce the uncertainty of management decisions, and accomplish successful conservation.

A fundamental component of the adaptive management process is to exchange scientific results, observations, and experiences on an ongoing basis as part of a process of structured decision-making. Therefore, it is critical that the SETT continues to collaborate with research agencies and partners on current and potential research projects.

2.4.1 Research Collaboration

Continue to refine and share our knowledge of rangeland ecology, habitat restoration and conservation biology to provide the best available science for informing management and permitting decisions in SGMAs.

Potential partners and contributors: SEP, BLM, USFS, NRCS, University of Nevada, NDOW, NDF, NDA, Tribal Nations, Private Land Owners

Action 2.4.1-1 Conduct an annual Nevada Sagebrush Ecosystem Conference with invited speakers and guests from Nevada and throughout the Great Basin to inform management agencies and land users of monitoring results, trends in GRSG populations, observed effects of conservation treatments and predicted outcomes of land use decisions and regulations. Compile the conference information and distribute to Nevada stakeholders, Resource Management Agencies, Congressional delegations, and other participants.

Action 2.4.1-2 Update the State Plan and SAP as appropriate to incorporate new findings. Provide recommendations to BLM and USFS on LUPAs to reflect innovative science and state-of the-art management.

2.4.2 Seasonal Stage and Risk Maps

Potential partners and contributors: USGS, SEP, NDOW

Obtain life history stage-based maps of habitat suitability and survival probability from the USGS, Western Ecological Research Center (WERC). This entails producing seasonal maps that depict habitat used to complete a particular seasonal life stage (e.g., nesting, early brood rearing, late brood rearing, winter) rather than basing seasonal habitat map delineations simply on a period of months during the calendar year. Adequate data now exist across multiple sites and years in Nevada to perform this task with reasonable power.

Action 2.4.2-1 Collaborate with USGS to develop life-stage specific maps of habitat suitability using resource selection function methods (e.g., Coates et al. 2016a, 2016b) that incorporate patterns of radio-marked GRSG habitat use versus availability across > 10 field sites in Nevada.

Action 2.4.2-2 Collaborate with USGS to develop spatially explicit relative risk maps to illustrate source and sink areas for different populations of GRSG in Nevada. Relative risk maps essentially model survival probabilities as a partial function of habitat selection patterns.

2.4.3 Conifer Removal Benefits Index and Statewide Conservation Planning Tool

Potential partners and contributors: USGS, SEP, NDOW

A high resolution (1 m) map of P-J distribution across the State of Nevada derived from object recognition analyses of aerial (NAIP) imagery forms the backbone of multiple science support products (Coates et al. in prep). Utilizing this map and previously developed model outputs, USGS will develop a statewide decision support tool for assistance in GRSG management decisions. For example, a Conifer Removal Benefits Index (CRBI) for use in the Nevada CCS can be formulated to help calculate benefits to GRSG from removal of conifers based on modeled changes to Habitat Suitability Index (HSI) values. Additionally, the CRBI can be incorporated into a CPT environment that can aid in identifying specific areas for conifer treatment that provide the greatest ecological benefit to GRSG per unit relative to competing planned treatments.

Action 2.4.3-1 Support continual updates and improvements to the statewide P-J layer for public use and web-based publication. This involves error checking and possible incorporation of more recent NAIP imagery (i.e., 2016-17) in PMUs that have poor image quality resulting in poor accuracy locally.

Action 2.4.3-2 Support USGS efforts to develop a CRBI either as a component of the CPT or as its own separate task depending on desired use. The CPT/CRBI will utilize newly developed HSI values (and possibly relative risk values) integrated with lek-based measures of GRSG distribution and abundance (Ricca et al. in review). Sagebrush recovery (e.g., growth rates) following P-J removal, particularly in phase 1 and 2 habitats, will be modeled as a function of soil moisture and temperature index classes that can act as surrogate for sagebrush ecosystem productivity (Coates et al. 2015, Chambers et al. 2016). Hence, the CPT/CRBI will provide both current and projected (e.g., ~ 30 – 50 yr.) measures of ecological benefits to GRSG from P-J management.

Action 2.4.3-3 Support USGS efforts to develop a Python scripting tool that will produce a user-friendly Graphic User Interface. Ultimately, the interface will allow a user to select a proposed area for conifer removal (by heads-up drawing or shapefile import) and automatically calculate the current and projected CBII. Ultimately, the tool will be made publically available for general use.

2.4.4 CCS Site Scale Data Collection Alternatives

Potential partners and contributors: USGS, SEP, NDOW

Research alternative approaches to collecting intensive site-scale transect/Daubenmire plot data for use in the CCS. This may entail correlating microsite data collected around that State by USGS in conjunction with high-resolution and interpolated mapping products developed by other USGS offices (C. Homer, USGS-EROS; C. Aldridge, USGS-FORT).

Action 2.4.4-1 Support USGS efforts to conduct regression-based analyses to determine relations between ground-measured micro-habitat characteristics (e.g., shrub cover, shrub height, etc.), satellite imagery reflectance, and interpolated microhabitat characteristics. We will leverage the extensive (e.g., thousands), 6+ year dataset of micro-habitat sampling across ~ 15 sites in Nevada collected by USGS-WERC.

2.4.5 BSU and Project Level Effectiveness Monitoring (Integrated Population Models)

Potential partners and contributors: USGS, SEP, NDOW

Develop a hierarchical lek monitoring scheme that will: 1) contribute towards the development of a statewide integrated population model for GRSG; and 2) aid in evaluating the effectiveness of various land-use projects (e.g., CCS projects or agreements, surface-use disturbance mediation, habitat restoration work). This component will leverage against existing support for range wide GRSG monitoring and Integrated Population Model (IPM) development.

Action 2.4.5-1 Support USGS efforts to Identify lek clusters based on methods being developed by C. Aldridge (USGS-FORT) and others in Wyoming.

Action 2.4.5-2 Support USGS efforts to develop a preliminary statewide IPM utilizing hierarchical lek count data coupled with vital rate information collected at USGS-WERC monitoring sites.

3.0 PROJECT TOOLBOX

3.1 FUNDING RESOURCES

Funding for implementation of a long term, sustainable conservation plan will build upon the State and federal grant programs with local funding sources to meet match requirements. Mitigation of anthropogenic disturbances through the Nevada CCS will promote funding restoration and delivery of measurable environmental outcomes by the private sector.

Farm Bill 2000: The Natural Resources Conservation Service (NRCS) is a federal agency under the USDA (www.nrcs.usda.gov/programs/). NRCS offers landowners financial, technical, and educational assistance to implement conservation practices on privately owned land. Using this help, farmers, ranchers, and forest landowners apply practices that reduce soil erosion, improve water quality, and enhance cropland, forestland, wetlands, grazing lands, and wildlife habitat. Conservation plans are developed with individual landowners to suit their specific situation. The landowner is the decision-maker, but conservation practices must meet NRCS standards and specifications. Participation in a cost-share program is not required to receive assistance. Landowners interested in technical assistance or cost-share programs are encouraged to contact the local NRCS field office for assistance. Contact Jim Gifford, Resource Specialist ji m.gifford@nv.usda.gov. Listed below are a few of the most utilized NRCS programs.

- Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land.
- Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through this program the Natural Resources Conservation Service (NRCS) provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed. WHIP has proven to be a highly effective and widely accepted program across the country. By targeting wildlife habitat projects on all lands and aquatic areas, WHIP provides assistance to conservation minded landowners who are unable to meet the specific eligibility requirements of other USDA conservation programs.
- Through the Sage Grouse Initiative (SGI) the NRCS uses Farm Bill conservation programs, such as the Environmental Quality Incentives Program (EQIP) and Agricultural Conservation Easement Program (ACEP), to provide technical and financial assistance to help ranchers accelerate installation of conservation practices on the ground. Conservation practices are designed to be win-win solutions addressing threats facing both GRSG and rangelands. This type of conservation work includes: developing grazing management practices to maintain nesting cover, removing encroaching conifers that have invaded sagebrush-steppe, securing conservation easements to keep working lands working as intact range in perpetuity, and making fences more visible to reduce GRSG collisions.

The United States Fish & Wildlife Service - Intermountain West Joint Venture (IWJV) programs: Traditionally directed at wetlands improvement, IWJV programs have expanded to include all birds. Small grants of $15,000 are available for habitat improvement. Applications for these funds require partnerships and shared costs. The improvements should be tied to increased numbers of GRSG. Contact Brian McDonald, IWJV Agreements and Grants Specialist 406-546-7755, brian.mcdonald@iwjv.org or Susan Abele, USFWS, 775-861-6346, susan_abele@fws.gov.

Southern Nevada Public Lands Management Act (SNPLMA): SNPMLA is one of the tools that could be used to purchase private properties or potential conservation easements for GRSG habitat conservation. SNPLMA is a source of funding for Nevada created by the sale of federal lands (BLM) in Clark County. While the majority of the revenue generated is stipulated for expenditure in Clark County, a small percentage of the proceeds are available to purchase "environmentally sensitive" properties statewide. All proposals submitted for SNPLMA acquisition require the landowner's consent, involvement of a federal agency partner and endorsement by the local government. Contact Gretchen Eykelbosh, 775-831-6740, geykelbosh@blm.gov.

National Fire Plan: This plan is the US Congress response to the severe wildfires of 2000 with the intent of reducing their impacts on rural communities and enhancing the firefighting capabilities in the future. The National Fire Plan assists in the implementation of five key areas: firefighting resources, rehabilitation and restoration, hazardous fuels reduction, accountability and community assistance. Funding is administered through the Bureau of Land Management and the Nevada Division of Forestry (NDF). Where GRSG habitat improvement can also be tied to fuels reduction projects and Multi-Resource Stewardship, funding through the NDF or BLM may be available.

National Fish and Wildlife Foundation (NFWF): NFWF supports projects that conserve the nation's wetland resources, in particular habitat for wetland-dependent fish and wildlife. NFWF generally funds three program types: acquisition of wetland resources, both in fee-title and conservation easements; wetland restoration and enhancement projects, particularly those on private lands; and applied research on wetland management techniques, restoration or enhancement practices, or other wetlands-related applied conservation.

The Wildlife Habitat Incentives Program (WHIP): WHIP is a component of the 1996 USDA Farm Bill and is voluntary program for people who want to develop and improve wildlife habitat on private lands. It provides both technical assistance and cost sharing to help establish and improve fish and wildlife habitat.

The Conservation Reserve Program (CRP): Offered by the USDA's Farm Service Agency, the CRP is the federal Government's single largest environmental improvement program, and one of its most effective. Today, the CRP is safeguarding millions of acres of American topsoil from erosion, increasing wildlife habitat, and protecting ground and surface water by reducing water runoff and sedimentation. Countless lakes, rivers, ponds, and streams are cleaner and more vital in part because of the CRP.

NDF Forest Health Grant: This funding is currently available from NDF to Nevada forest landowners with 5 acres or more or of native trees to thin the stands, spray high value trees to kill the insects or prevent them from attacking the trees, apply pheromones (bug scents) and to repel bark beetles, etc. The funding is granted to private forest landowners using "reimbursable sub-grants" on a 50:50 basis. Contact Gene Phillips, Forest Health Specialist 775-849-2500 ext 241.

Western States Fire Managers (WSFM) and Hazardous Fuels Community Protection Grants (HF-CP): These programs provide grants for projects up to $260,000 that mitigate risk within Wildland Urban Interface (WUI) areas. Proposals should address issues identified in Community Wildfire Protection Plans (CWPP) or other wildfire mitigation planning documents, the broad goals within Nevada's Forest Action Plan, and demonstrates collaborative interagency planning and implementation coupled with citizen ownership. Emphasis is on hazard fuel reduction, restoration of fire-adapted ecosystems, and mitigation education within the WUI, and Wildfire Protection Planning. Contact Ryan Shane, 775-684-2511.

USFS S&PF Landscape Scale Restoration (LSR) grants: Annual grant cycles, administered by NDF, for projects up to $300,000. LSR should address local or statewide forest or rangeland resource issues, and broad goals and strategies in Nevada's Forest Action Plan (State Wide Forest Resource Assessment) within the project's priority landscape area. Innovative projects are sought that integrate various programs (e.g., Forest Health, Urban & Community, Stewardship, Fire, etc.) and partners and cross any combination of ownership, management or jurisdictional boundaries. Cross-boundary projects are encouraged as they expand project outcomes at watershed, regional and state levels. Detailed information available at Contact Heather Giger at 775-684-2500.

3.2 PROJECT ASSESSMENT TOOLS

The links and tools below should be used to prioritize projects and treatments at the site scale.

3.2.1 Nevada Conservation Credit System (CCS): A tool that can assist landowners who may be considering projects that disturb, protect, enhance, or restore sagebrush ecosystem habitats that are important to GRSG. The CCS is a tool that can be used to help minimize impacts or enhance conservation efforts across the range of GRSG habitat in Nevada. It is the primary tool used to implement compensatory mitigation in Nevada.
http://sagebrusheco.nv.gov/
https://www.enviroaccounting.com/NVCreditSystem/Program/Home

3.2.2 Habitat Assessment Framework: From reviewing habitat quality, including sagebrush, perennial forb, and grass cover at a site scale to understanding habitat availability and anthropogenic disturbances at a fine and mid-scale, the habitat assessment framework is a tool that provides resource managers and specialists with a comprehensive framework for assessing GRSG habitats in the sagebrush ecosystem. Further information can be found below at:
http://www.blm.gov/style/medialib/blm/wo/blm_library/tech_refs.Par.34086.File.dat/TR_6710-01.pdf

3.2.3 The Landscape Approach Data Portal: A one-stop source for BLM landscape initiatives including Rapid Ecoregional Assessments (REAs), FIAT, and SGI. The five main content types available are: data, map services, models, documents, and static maps. Content is available at:
http://www.landscape.blm.gov/geoportal/catalog/main/portal.page

3.2.4 The Fire and Invasives Assessment Tool (FIAT): A standardized agency assessment protocol that incorporates Resistance and Resilience concepts as committed to in the GRSG Land Use Plan Amendments. The process assesses contributing factors to the loss of GRSG habitat including wildfire, conifer expansion, and invasive annual grasses.
http://sagebrusheco.nv.gov/uploadedFiles/sagebrusheconvgov/content/Meetings/2015/Presentation-%20Item%208-Nevada_SEC_pdf.pdf
http://www.landscape.blm.gov/geoportal/catalog/FIAT/FIAT.page

3.2.5 The Integrated Rangeland Fire Management Strategy Actionable Science Plan: This plan outlines the need for coordinated, science-based adaptive management to achieve long-term protection, conservation, and restoration of the sagebrush ecosystem. Results from the priority science needs described in the plan will provide information that could directly inform actions taken by managers to protect, conserve, or restore the sagebrush ecosystem. The Plan also outlines the actions to facilitate the process of funding and implementing research efforts and effectively communicating research results to the management community.
http://integratedrangelandfiremanagementstrategy.org/IRFMS_Actionable_Science_Plan.pdf

3.2.5 Resistance and Resilience Concepts: The document discusses factors that determine sagebrush ecosystem resilience to disturbances (e.g., wildfire) and resistance to invasive annual grasses based on precipitation, soil moisture and temperature regimes. Available at: http://www.fs.fed.us/rm/pubs/rmrs_gtr326.pdf

3.2.6 SAGEMAP - A GIS Database for Sage-grouse and Shrub steppe Management in the Intermountain West

http://sagemap.wr.usgs.gov/

3.2.7 Field Office Technical Guides (FOTG)

https://efotg.sc.egov.usda.gov/efotg_locator.aspx

3.2.8 Web Soil Survey (WSS)

http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/ecoscience/desc/

http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

3.2.9 Nevada Rangeland Monitoring Handbook (NRMH) and Rancher's Monitoring Guide and Range Management School (2nd link)

http://nevada.rangelands.org/Publications.html

http://www.unce.unr.edu/programs/natural/

The NRMH is currently being reviewed and revised. The new edition should be published in early 2017.

3.2.10 Proper Functioning Conditions for Lentic and Lotic Sites

http://www.blm.gov/nstc/library/pdf/Final%20TR%201737-9.pdf

http://www.ecologicalsolutionsgroup.com/Documents/PDFforms/UserManuals/USALenticPFCCheckMan.pdf

http://www.ecologicalsolutionsgroup.com/Documents/PDFforms/UserManuals/USALoticPFCChecklistMan.pdf

http://www.unce.unr.edu/programs/natural/

3.3 CURRENT POLICY AND REGULATIONS

3.3.1 NV CA Greater Sage Grouse Land Use Plan Amendment

https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=31103

3.3.2 Idaho and Southwest Montana, Nevada and Utah Greater Sage Grouse Land Management Plan Amendment

http://www.blm.gov/ut/st/en/prog/planning/SG_RMP_rev/ARMPA.html

4.0 PLANNING AREA PRIORITIZATION AND IMPLEMENTATION GUIDANCE

Successful landscape-scale conservation plans incorporate the best available science tools and guidance on habitat, soils, ecological status and potential, fire history, resilience and resistance concepts, GRSG population status and trends, and other data useful for verifying threats to GRSG. Scientific data should be used in collaboration with local stakeholder experience and insight to help identify opportunities to implement actions and mitigate threats in the Planning Areas. Projects compiled at the landscape-scale as Action Plans should include as much detail as possible such as objectives, schedules, monitoring protocols, budgets and adaptive management criteria specific to individual project areas. Information in this document is provided as a starting point for local area threat assessments, development of action plans, and prioritization of geographic areas for habitat restoration. Site-scale project planning within each unit will require a more in-depth and detailed investigation of current and historical conditions and resource status.

Sections 4.1 – 4.6 of this plan are intended as pullout documents for local stakeholders to use in their implementation of the SAP. Each pullout document is organized by Planning Areas and further delineated into BSUs. The descriptions and information provided here is intended to serve as an initial overview for each BSU. Originally, the Nevada Department of Wildlife (NDOW) designated GRSG PMUs in 2001 based on GRSG distribution, available telemetry data, and personal knowledge of Nevada Biologists. In 2015, the PMUs were consolidated into 18 distinct BSUs based upon further knowledge of how GRSG interact with the landscape and with adjacent populations. These larger geographic management and planning units provide opportunities for more efficient planning by LAWGs, land managers, and the State and federal resource management agencies.

There are maps included as part of this guidance document that include the SEP Management Categories, land ownership, wildfire and invasive grass coverage, P-J coverage, BLM and USFS grazing allotments, wild horse and burro herd management areas, and anthropogenic disturbances (e.g., roads, mines, urban) at the end of each Planning Area assessment. These maps are intended to help visually identify potential areas to focus specific management or conservation strategies (e.g., P-J removal) and assess the degree of threats within BSUs. Information contained in these risk assessment maps will be updated on an annual basis with new research and monitoring data to provide the most reliable information.

Much of the information provided in this section was obtained from NDOW PMU or State Conservation Plans, and Conservation Plans and Strategies produced by LAWGs, Stewardship groups, and technical review teams. Threat assessments and tables were adapted from available local area Conservation Plans if available, but where site-specific information was lacking, the Conservation Objectives Team (COT) Final Report was used to describe threats to Planning Areas (USFWS, 2013). Many of the Nevada PMU and Conservation documents were completed by 2004 and likely contain outdated information or may be inadequate due to the absence of data at that time. This section is will be improved as scientific data become available to update sections on population status and trends, threat assessments, and key conservation strategies within the six GRSG Planning Areas of Nevada. Invaluable assistance from

subject matter experts who have applicable knowledge and expertise of concepts or implementation experience of specific tools or planning mechanisms can aid in project development and implementation.

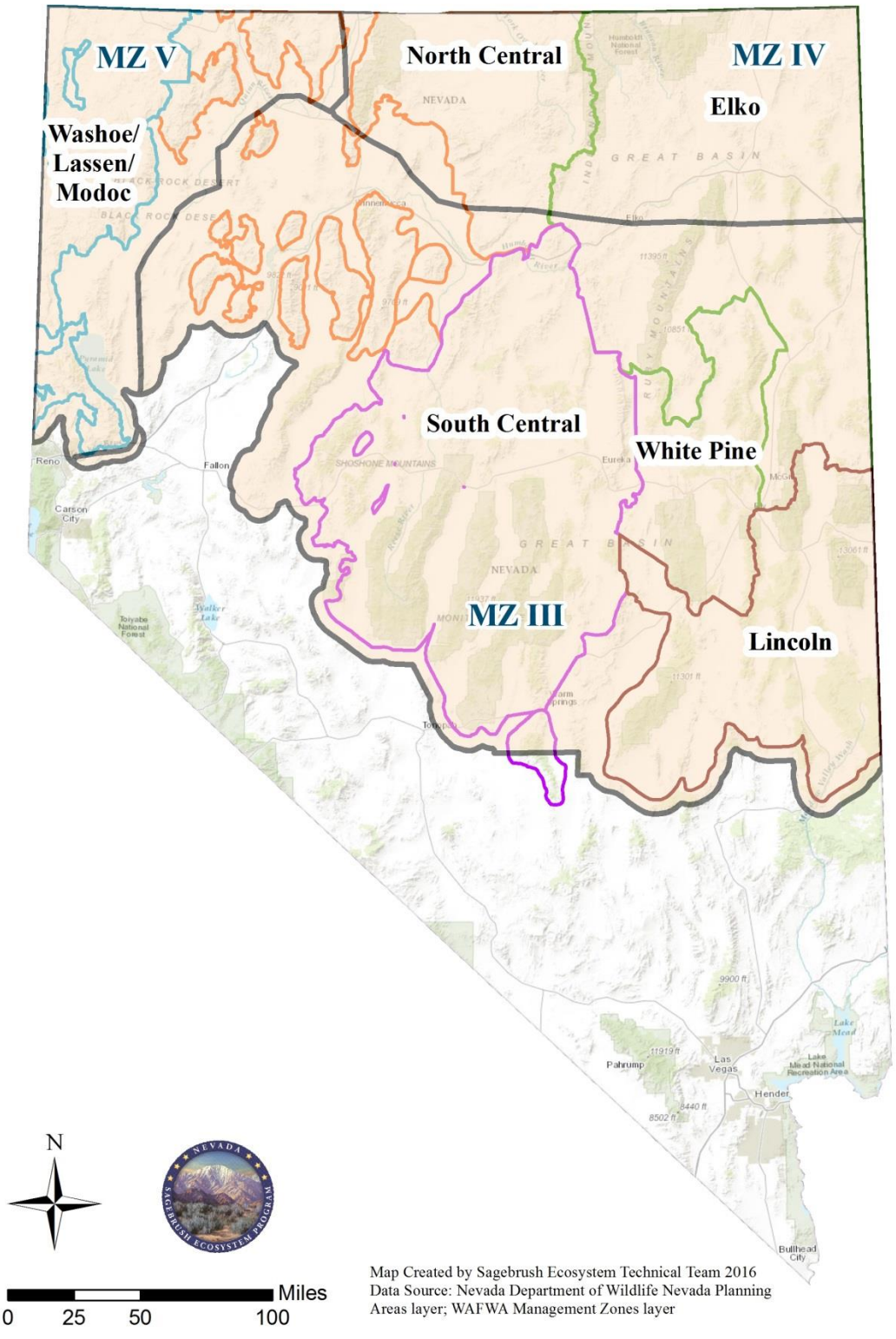


Figure 1. Nevada Greater Sage-grouse Planning Areas and WAFWA Management Zones.

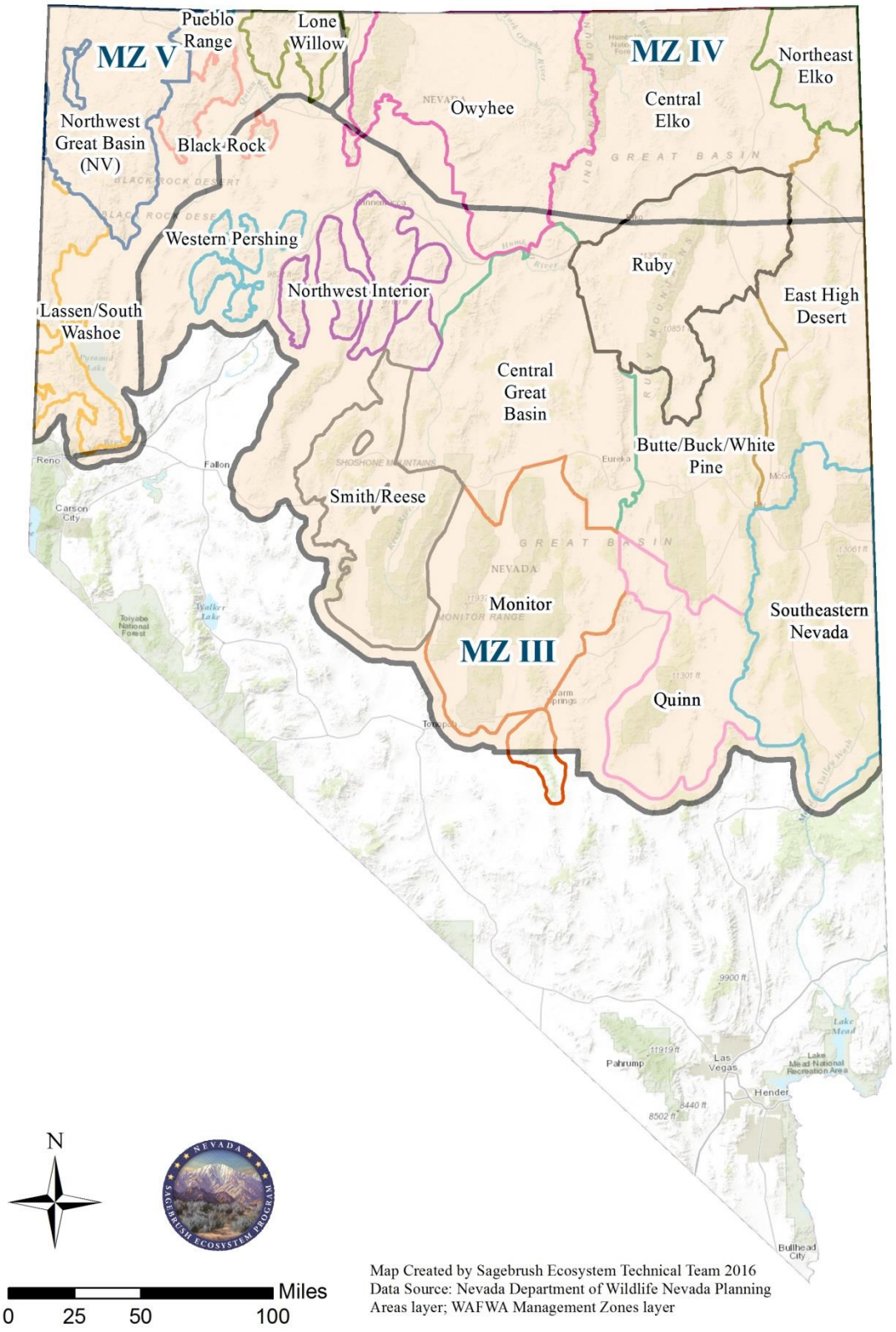


Figure 2. Nevada Greater Sage-grouse Biologically Significant Units and WAFWA Management Zones.

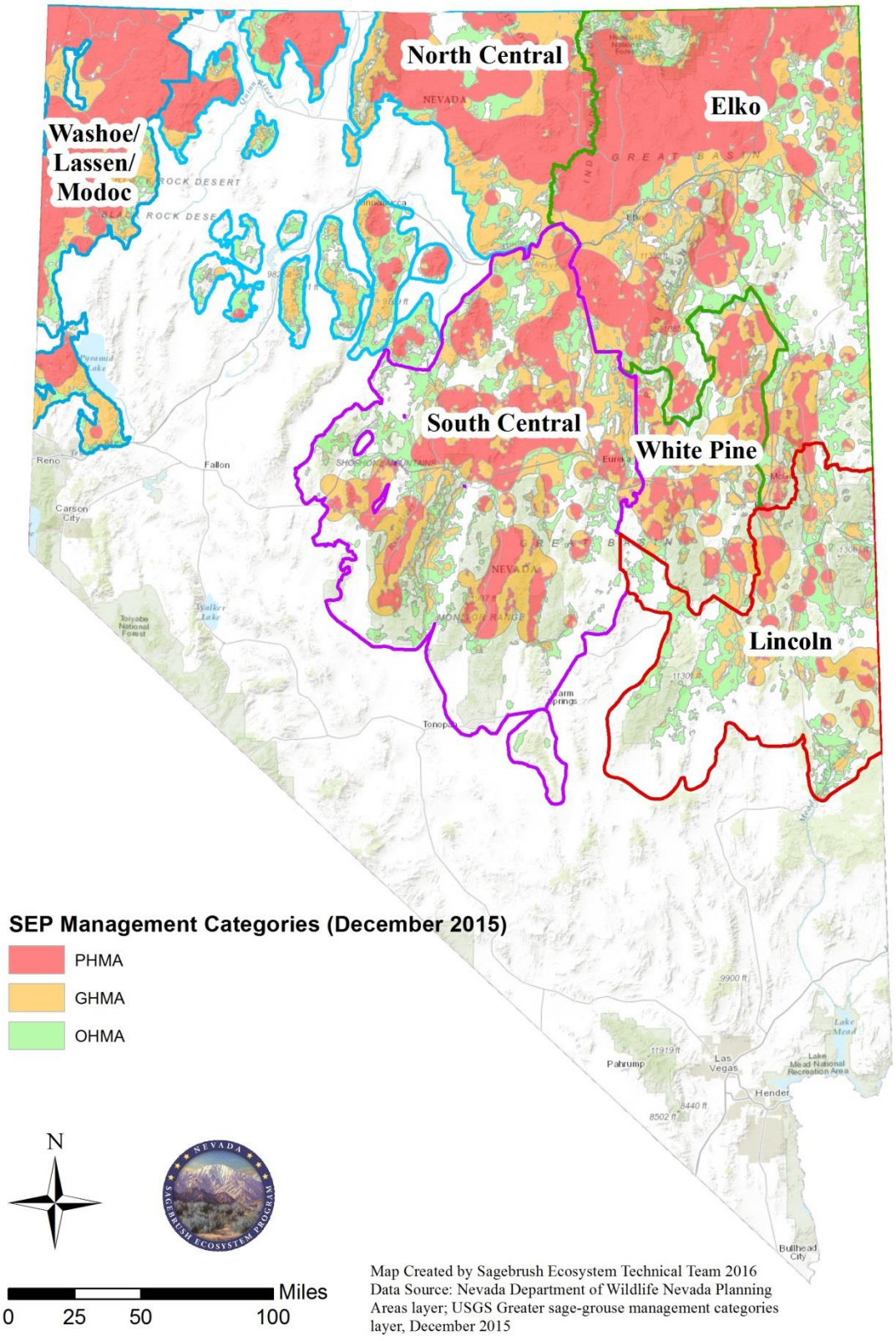


Figure 3. Greater Sage-grouse SEP Management Categories and Planning Areas.

4.1 WASHOE/LASSEN/MODOC PLANNING AREA

The Washoe/Lassen/Modoc Planning Area occurs within the Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) V. The Nevada portion of MZ V is comprised of two Biologically Significant Units: the Northwest Great Basin Unit and the Lassen Unit. A portion of both BSUs occur within California. Trend lek attendance for the Planning Area is provided in Figure 4. The primary threats identified within the Nevada portions of the MZ V include wildfire, invasive annual grasses, improper livestock grazing, overutilization by wild horses, energy development, and P-J encroachment. Small, isolated populations exist within the planning area that further increases risk and can reduce population persistence. Several significant fires have occurred in the Planning Area. The Virginia Mountains Complex fire in 2016 burned ~59,700 acres in the Virginia PMU. The Rush fire in 2012 burned approximately 48,000 acres in Nevada and 313,000 acres including the adjacent California population. Due to portions of this Planning Area occurring in low to moderate R&R systems, conservation and management should be prioritized on pre-fire suppression, noxious and invasive weed suppression, post-fire treatments, and noxious invasive annual grass treatments.

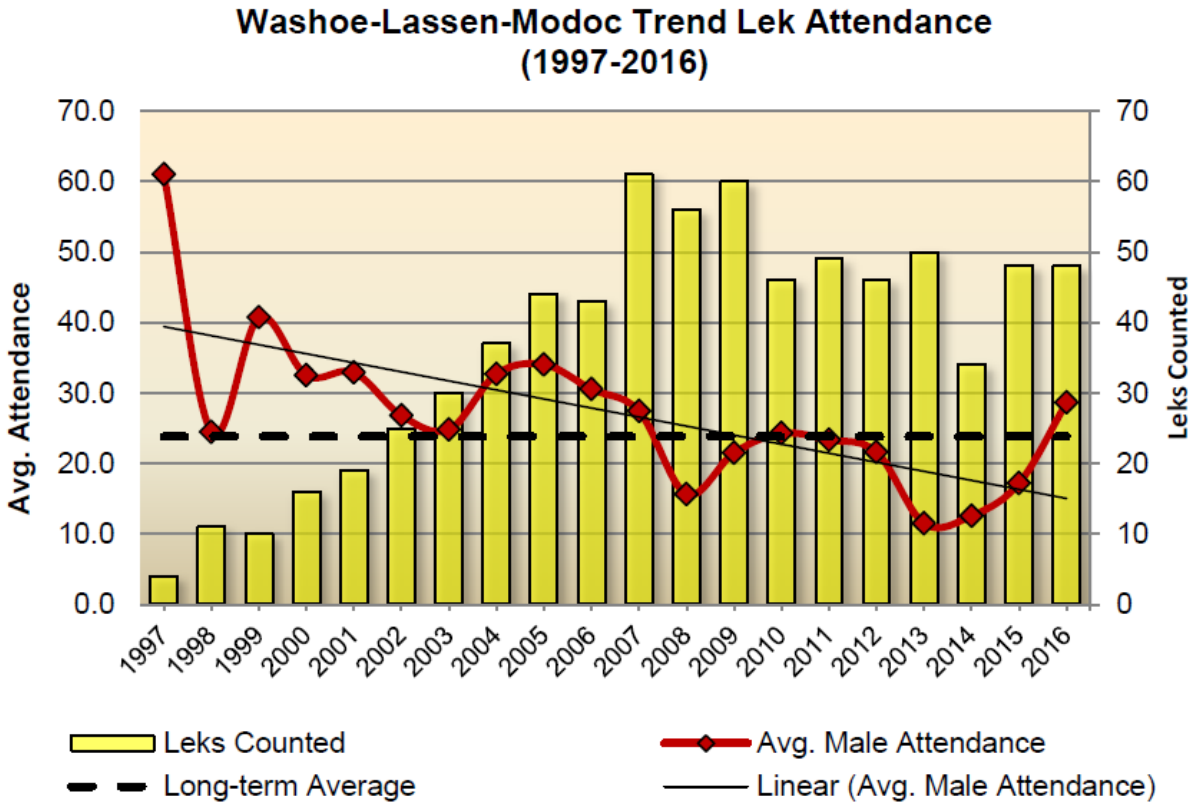


Figure 4. Trend lek attendance in the Washo/Lassen/Modoc Planning Area during 1997 – 2016 (NDOW 2016a).

4.1.1 Location

4.1.1.1 Northwest Great Basin BSU

The Northwest Great Basin BSU encompasses approximately 2,303,879 acres in Washoe, Humboldt and Pershing Counties and includes the Vya, Sheldon and Massacre PMUs. It is within Major Land Resource Area (MLRSA) 23 (Malheur High Plateau) and MLRA 27 (Fallon-Lovelock Area). Management of public lands is administered by the Winnemucca BLM District. The Sheldon National Wildlife Refuge (NWR) also occurs within the BSU. The Nevada/California state line forms the northwest boundary, and the Nevada/Oregon state line forms the north boundary. Portions of the western boundary cross over into Modoc and Lassen Counties in California.

4.1.1.2 Lassen/South Washoe BSU

The Lassen/South Washoe BSU encompasses approximately 2,170,726 acres in Nevada and California and includes the Buffalo/Skedaddle and Virginia/Pah Rah PMUs. The Nevada portion of the BSU is in Washoe County, and the California portion is in Lassen County. The Nevada portion of the BSU is located within MLRA 23 (Malheur High Plateau), MLRA 27 (Fallon-Lovelock Area) and MLRA 26 (Carson Basin and Mountains). Management of public lands is administered by the Carson City and Winnemucca BLM Districts and the Humboldt Toiyabe National Forest. Interstate 80 forms a portion of the southern boundary. State Route 446 along the western shore of Pyramid Lake forms a portion of the eastern boundary for this BSU.

4.1.2 Threat Assessment

4.1.2.1 Northwest Great Basin BSU

Threats to the Northwest Great Basin BSU by PMU are listed in Table 1. Wildfire, invasive annual grasses, and overutilization by feral horses are considered the most significant threat to GRSG populations within this BSU. The BSU contains relatively large tracts of contiguous habitat with little or no fragmentation. Overutilization by wild horses and burros, particularly in the Sheldon PMU, has resulted in the degradation of meadow and riparian habitats. In the Massacre and Vya PMUs, lower elevations within the PMU are susceptible to cheatgrass and noxious weed invasion and many areas have a strong cheatgrass understory component. Conifer encroachment is also high due to long-term fire suppression within these areas.

In the Sheldon PMU, The Sheldon NWR Comprehensive Conservation Plan and Environmental Impact Statement identified grazing by feral horses to be one of the primary factors affecting native plants, wildlife, and ecosystem health, as well as preventing the restoration of habitat within the Refuge (USFWS 2012). A majority of springs and meadow habitat within Sheldon NWR have been overgrazed and trampled by feral horses that has reduced plant vigor and resulted in deterioration of riparian communities (USFWS 2008). Cheatgrass occurs in lower quantities in the Sheldon compared to other PMUs in the

region, as a considerable portion of the PMU is at higher elevations where cheatgrass is not as competitive. In addition, native vegetation has responded and recovered following burns in much of the PMU.

4.1.2.2 Lassen/South Washoe BSU

Threats to the Lassen/South Washoe BSU are listed in Table 1. Wildfire and invasive annual grasses are considered the most significant threat to GRSG populations within this BSU. P-J encroachment is also more prevalent in the Lassen/South Washoe BSU compared the Northwest Great Basin PMU, further degrading and shrinking GRSG habitat. Improper livestock grazing and overutilization by feral horses and burros, especially within the Buffalo/Skedaddle PMU, have also resulted in the degradation of meadow and riparian habitats.

The Rush fire in the Buffalo/Skedaddle PMU may result in significant negative impacts to GRSG populations considering several of the largest leks (within California), as well as movement and connectivity corridors to the Nevada population, were located within the burn area. Populations within this PMU were not considered to be isolated, but post-fire effects may have important implications on movement and connectivity between these California populations to Northwester Nevada.

The Virginia/Pah Rah PMU contains small and isolated populations where large fires such as the Rush Fire or the recent Virginia/Pah Rah Mountains Fire directly affecting this region could jeopardize population persistence. The Virginia/Pah Rah PMU is also within close proximity to urban areas and is more susceptible to risks associated with energy development, infrastructure, and recreation.

Table 1. Summary of threats to Greater Sage-grouse within the Washoe/Lassen/Modoc Planning Area by PMU. Threat assessment information acquired from the Greater Sage-grouse Conservation Plan for Nevada and California[1] (Sage-grouse Conservation Team 2004), the Conservation Strategy for Sage-grouse within the Buffalo – Skedaddle Population Management Unit[2] (Armentrout et al. 2013) and the COT Final Report[3] (USFWS 2013). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	**Threat Level by PMU**				
	Massacre	**Sheldon**	**Vya**	**Buffalo/ Skedaddle**[1]	**Virginia/ Pah Rah**
Isolated/Small Size	N[1,3]	N[1,3]	N[3]	N[3]	Y[1,3]
Sagebrush Elimination	L[1,3]	L[1,3]	L[1,3]	L[2,3]	N[3]
Agricultural Conversion	L[1,3]	N[1]	L[1,3]	L[2,3]	Y[1,3]
Fire	Y[1,3]	Y[1,3]	Y[1,3]	Y[2,3]	Y[1,3]
Conifers	Y[1,3]	L[1]	Y[1,3]	Y[2,3]	Y[1,3]
Weeds/Annual Grasses	Y[1,3]	L[1]	Y[1,3]	Y[2,3]	Y[1,3]
Energy	L[1,3]	L[3]	L[1,3]	L[3]	N[3]
Mining	L[1,3]	L[1,3]	L[1,3]	L[2,3]	L[3]
Infrastructure	L[1,3]	L[1,3]	L[1,3]	L[2,3]	Y[1,3]
Grazing	Y[1,3]	L[1,3]	Y[1,3]	Y[1,3]	Y[1,3]

Free-Roaming Equids	Y[1,3]	Y[1,3]	Y[1,3]	Y[1,3]	Y[1,3]
Recreation	L[1,3]	L[1]	L[1]	Y[2,3]	Y[1,3]
Urbanization	N[1]	N[1,3]	N[1,3]	N[2,3]	Y[1,3]
Predation	L[1]	L[1]	Y[1]	Y[2]	Y[1]

4.1.2.3 Management and Conservation Plans

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf

- Conservation Strategy for Sage-grouse (*Centrocercus urophasianus*) within the Buffalo – Skedaddle Population Management Unit

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/Buffalo-Skedaddle-PMU-Conservation-Strategy.pdf

- Nevada Sage-Grouse Conservation Project

  http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.1.3 Key Conservation Strategies for the Washoe/Lassen/Modoc Planning Area

4.1.3.1 General Management Guidelines

- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.

- Develop a public outreach and educational component for both anticipated and completed projects.

4.1.3.2 Priority Conservation Strategies

Northwest Great Basin BSU

- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Focus efforts to stop advancement of invasive annual grasses
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Manage livestock grazing in a sustainable, adaptive approach to promote successful re-establishment of planted vegetation following wildfire.
- Manage livestock grazing in a sustainable, adaptive approach to maintain or enhance habitat conditions within the SGMAs.
- Conduct PFC of meadows and riparian habitats within SGMAs and develop a monitoring program to identify areas that are Non-functioning or Functioning at risk, and prioritize those systems for conservation projects or development of new management plans.
- Encourage and support management of wild horse and burro populations at AML.
- Identify areas for Phase I and II P-J removal in SGMAs.

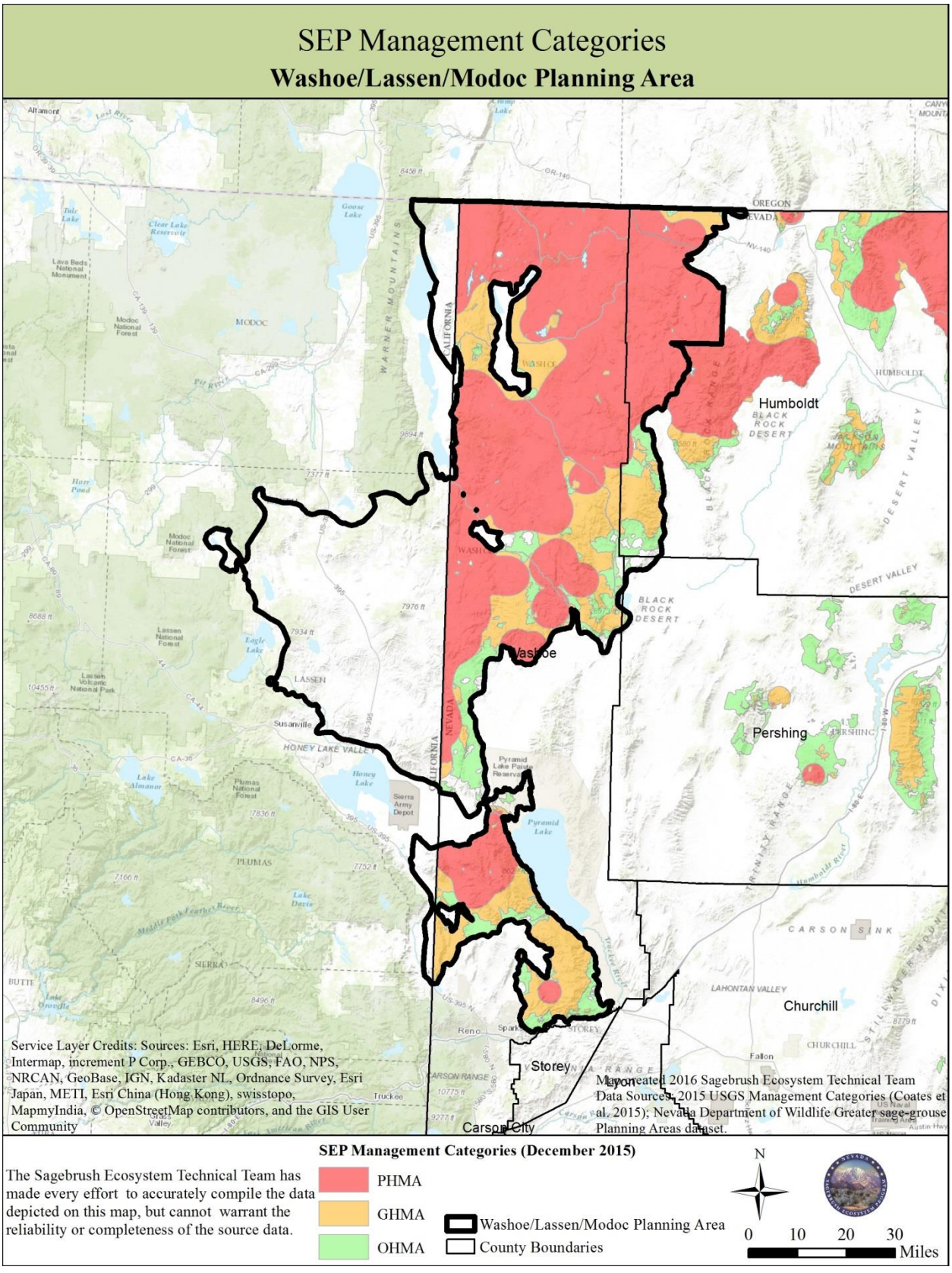
Lassen/South Washoe BSU

- Same strategies as above plus:
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).

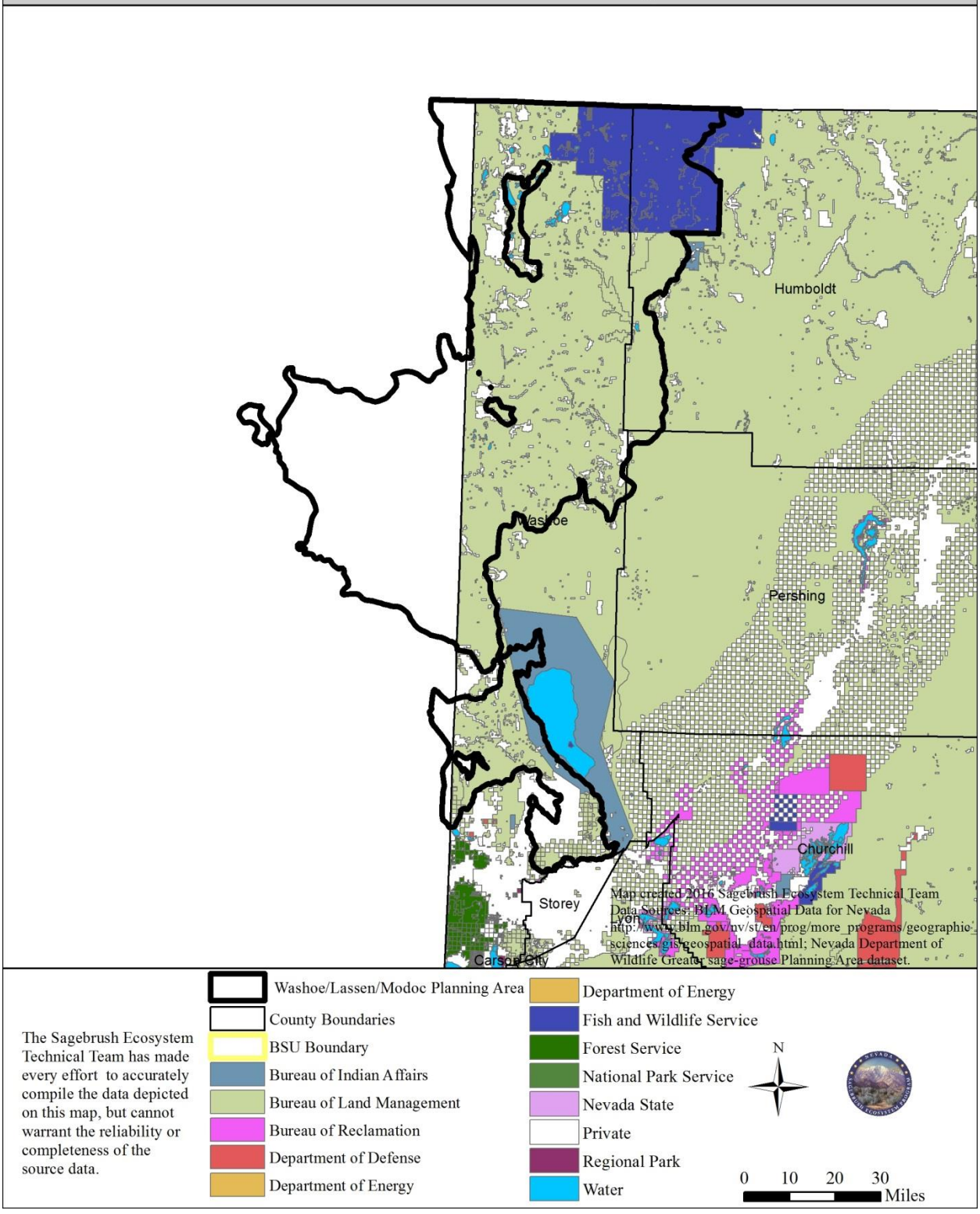
4.1.3.3 Secondary Conservation Strategies

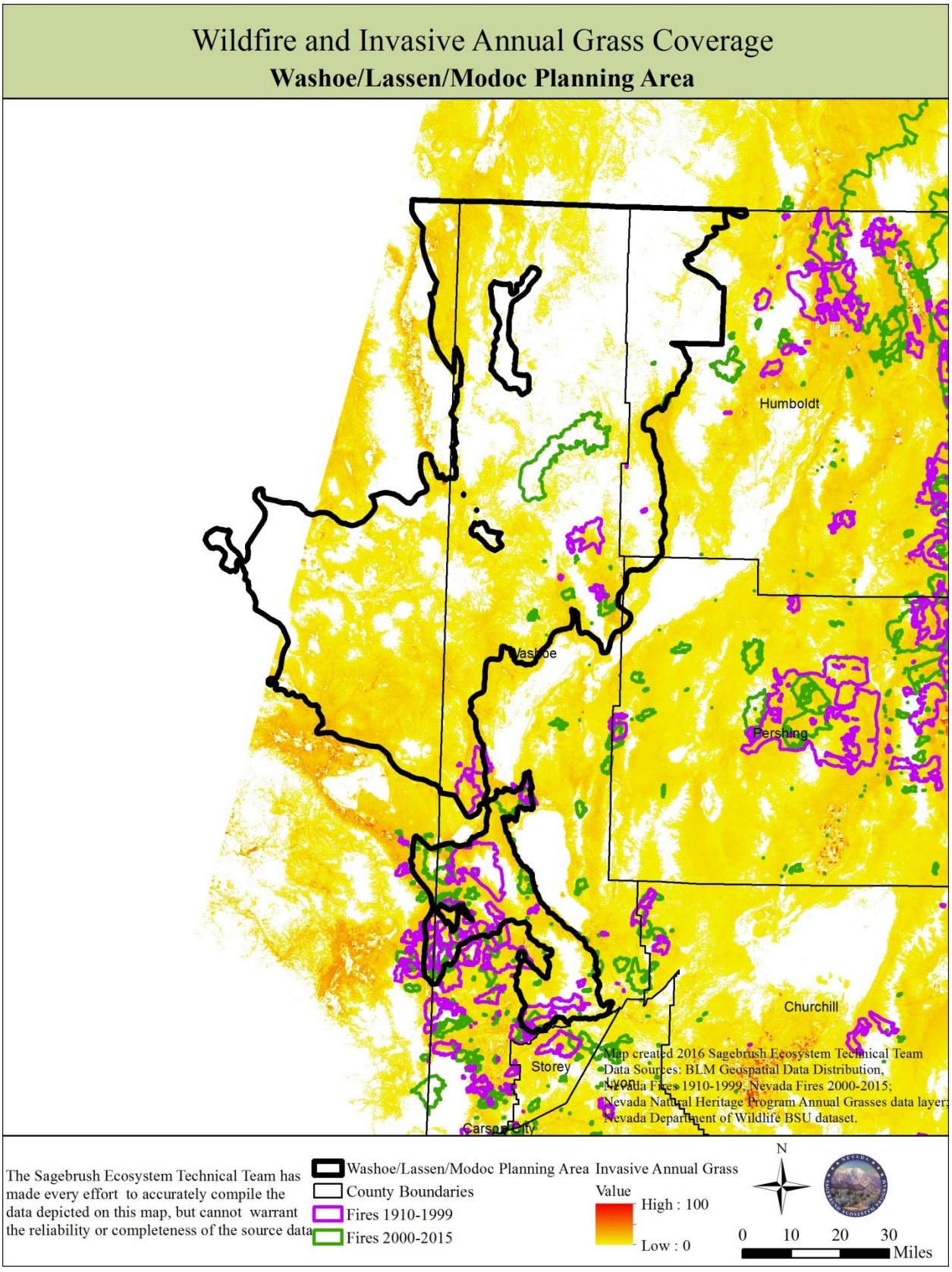
Northwest Great Basin BSU

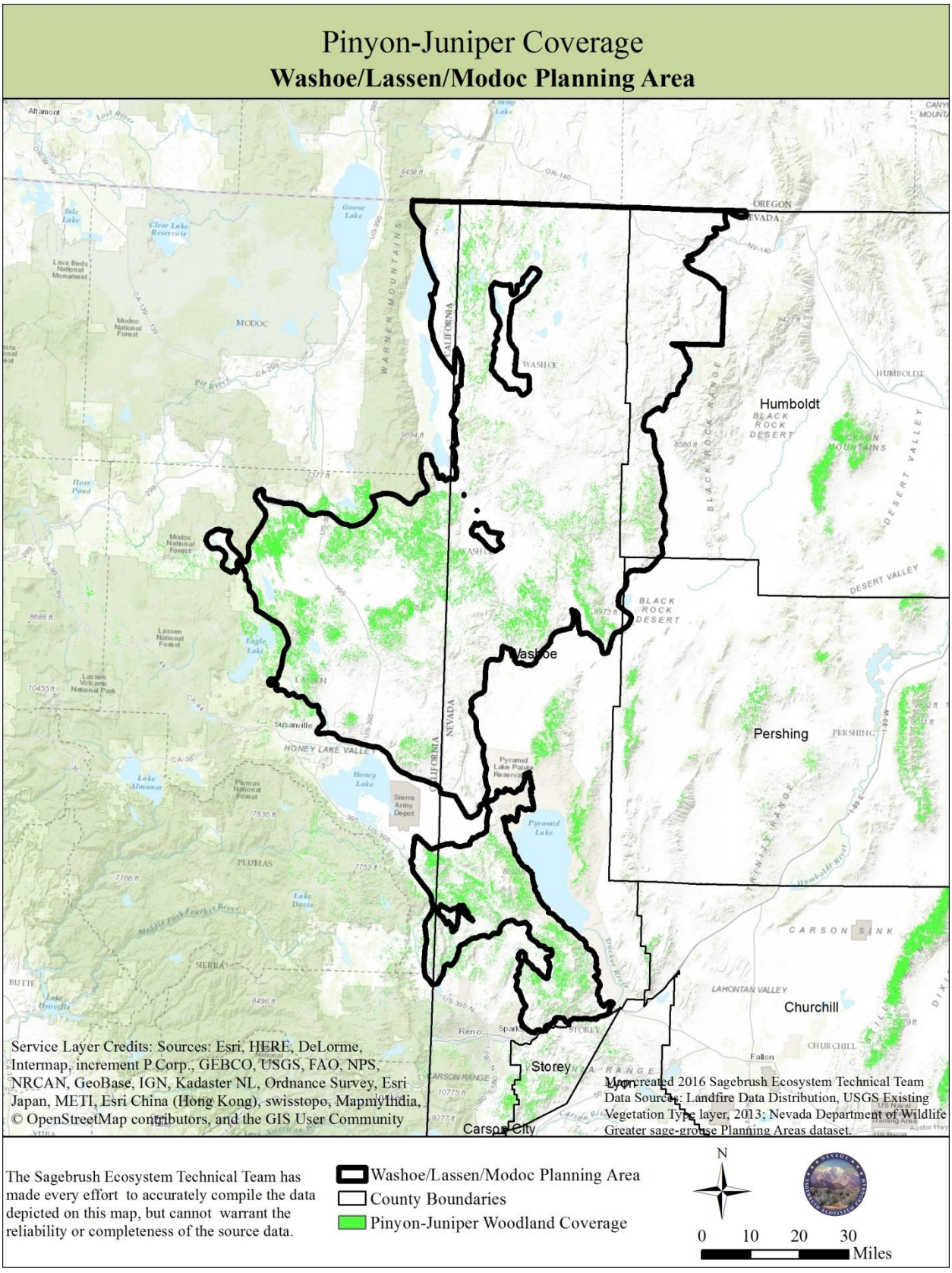
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).

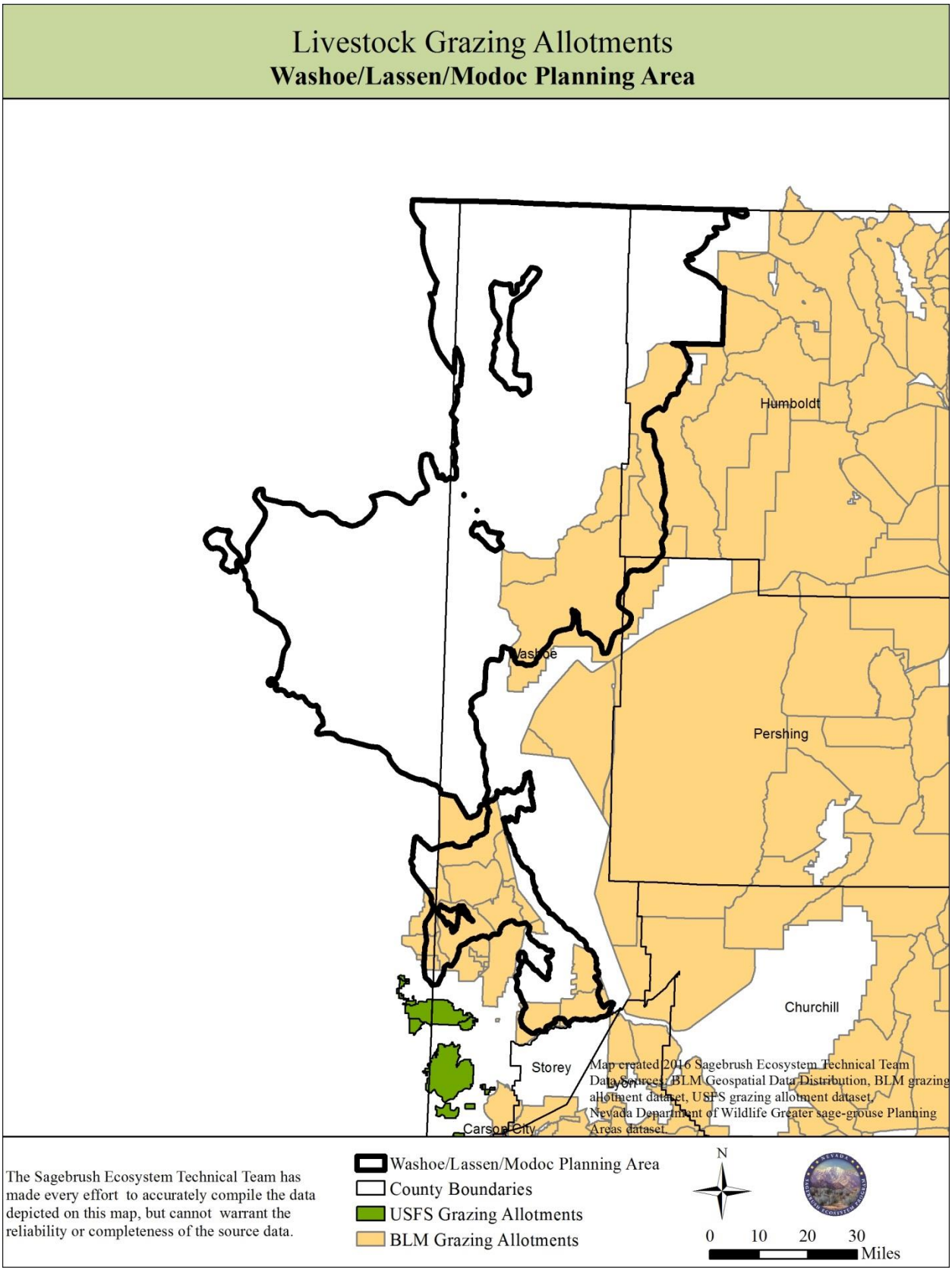

SEP Management Categories
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
Washoe/Lassen/Modoc Planning Area
County Boundaries
N
0 10 20 30
Miles

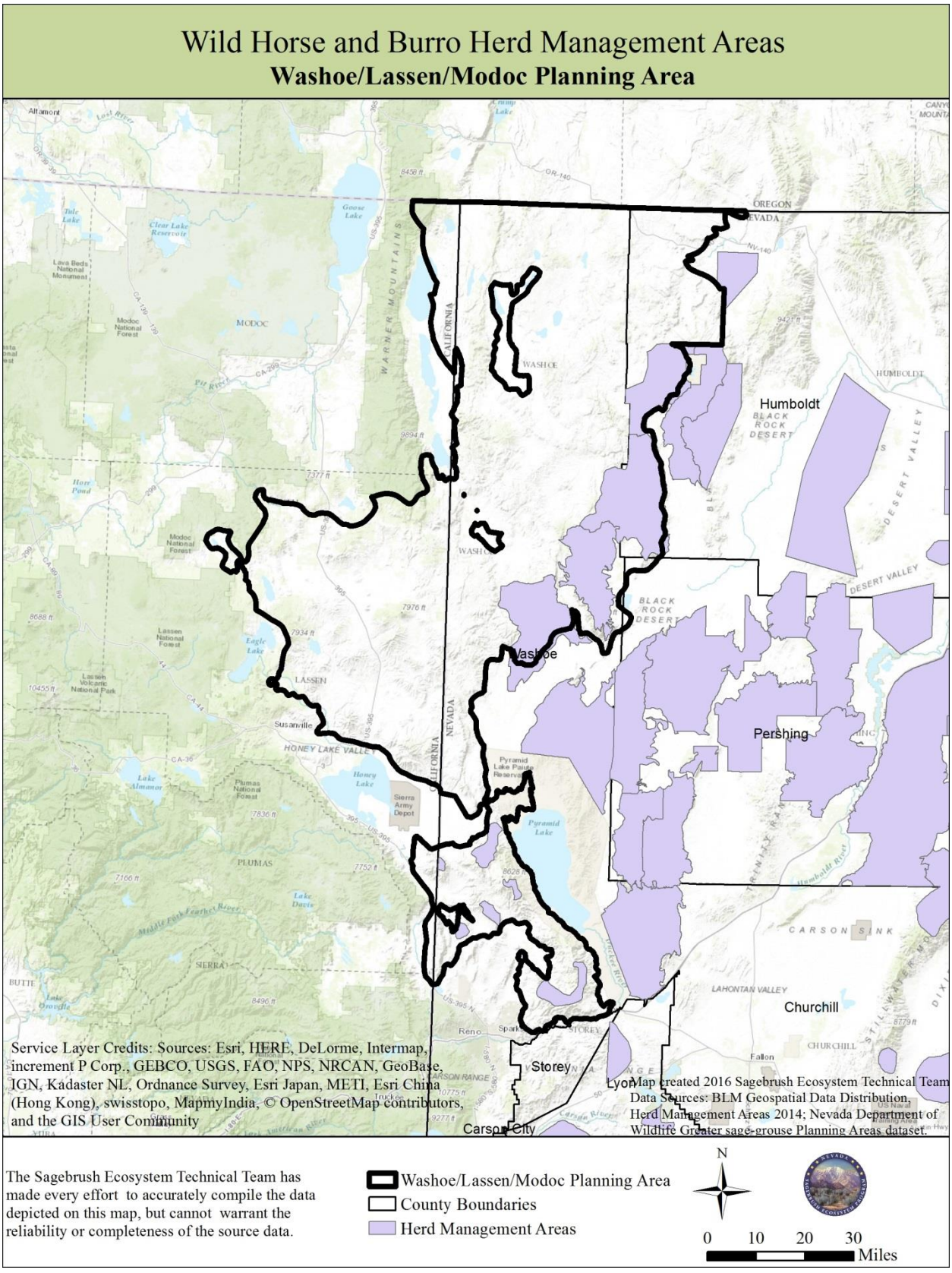
Land Ownership
Washoe/Lassen/Modoc Planning Area

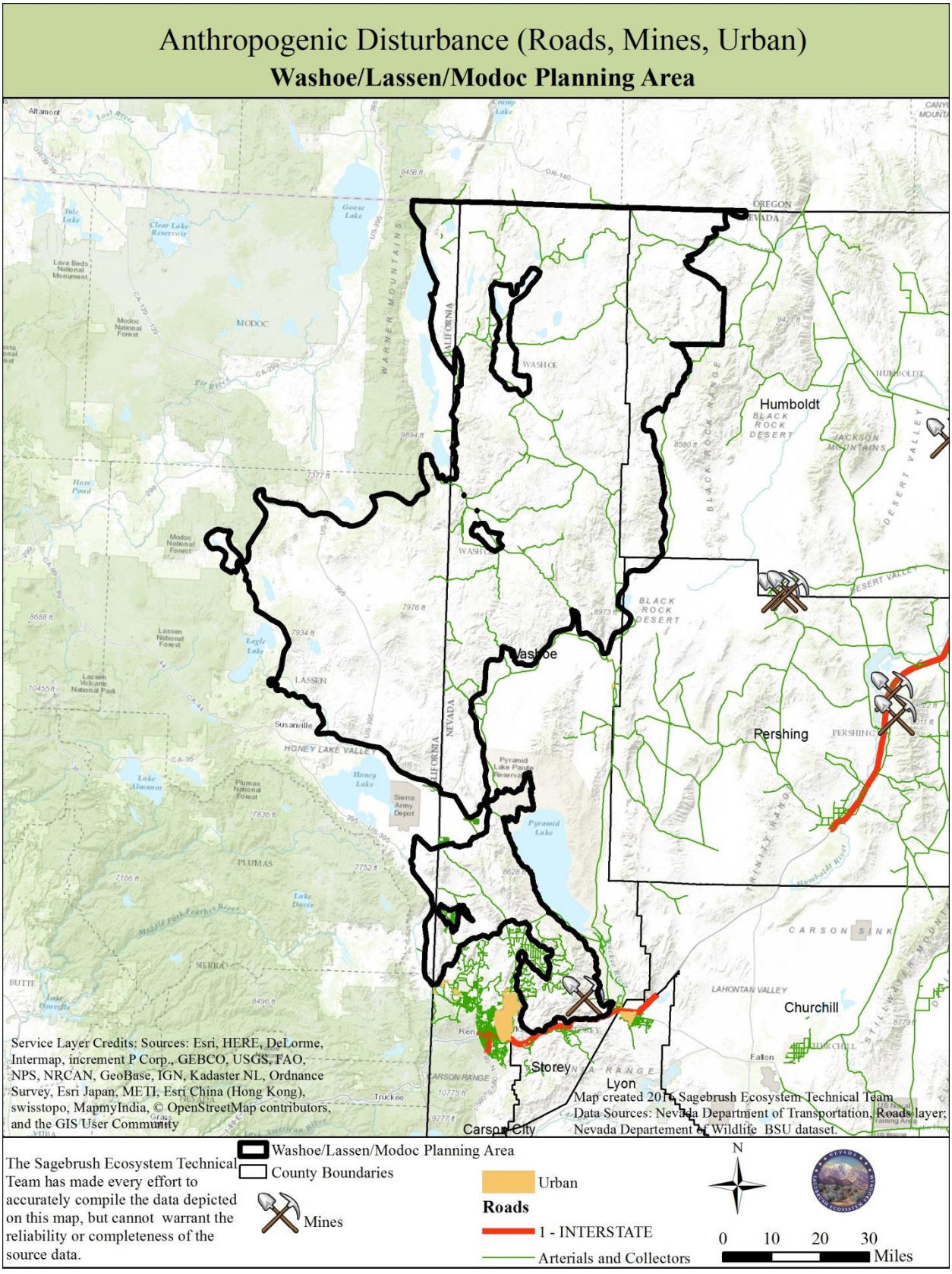



Wildfire and Invasive Annual Grass Coverage
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999; Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Washoe/Lassen/Modoc Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Reno
Susanville
MODOC
LASSEN
PLUMAS
SIERRA
BUTTE
WASHOE
HUMBOLDT
PERSHING
CHURCHILL
OREGON
NEVADA
CALIFORNIA
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Washoe/Lassen/Modoc Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Livestock Grazing Allotments
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Washoe/Lassen/Modoc Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Susanville
Reno
Fallon
OREGON
NEVADA
CALIFORNIA
MODOC
LASSEN
PLUMAS
SIERRA
BUTTE
HUMBOLDT
WASHOE
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Washoe/Lassen/Modoc Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Washoe/Lassen/Modoc Planning Area
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Carson City
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Roads layer; Nevada Departement of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Washoe/Lassen/Modoc Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles

4.2 NORTH CENTRAL PLANNING AREA

The North Central Planning Area occurs within portions of WAFWA MZs III, IV, and V. The Nevada portion of the WAFWA MZs is comprised of six Biologically Significant Units: the Black Rock, Lone Willow, Northwest Interior, Owyhee, Pueblo Range, and Western Pershing Units. Trend lek attendance for the Planning Area is provided in Figure 5. Many PMUs within this region contain small populations along isolated, dry, single ridge mountain ranges. The primary threats identified within the Nevada portions of the MZs III, IV and V include wildfire, invasive annual grasses, improper livestock grazing, overutilization by feral horses. Some P-J encroachment is present, but at a lower scale than other Planning Areas. Due to portions of this Planning Area occurring in low to moderate R&R systems, conservation and management should be prioritized on pre-fire suppression, noxious and invasive weed suppression, post-fire treatments, and noxious invasive annual grass treatments.

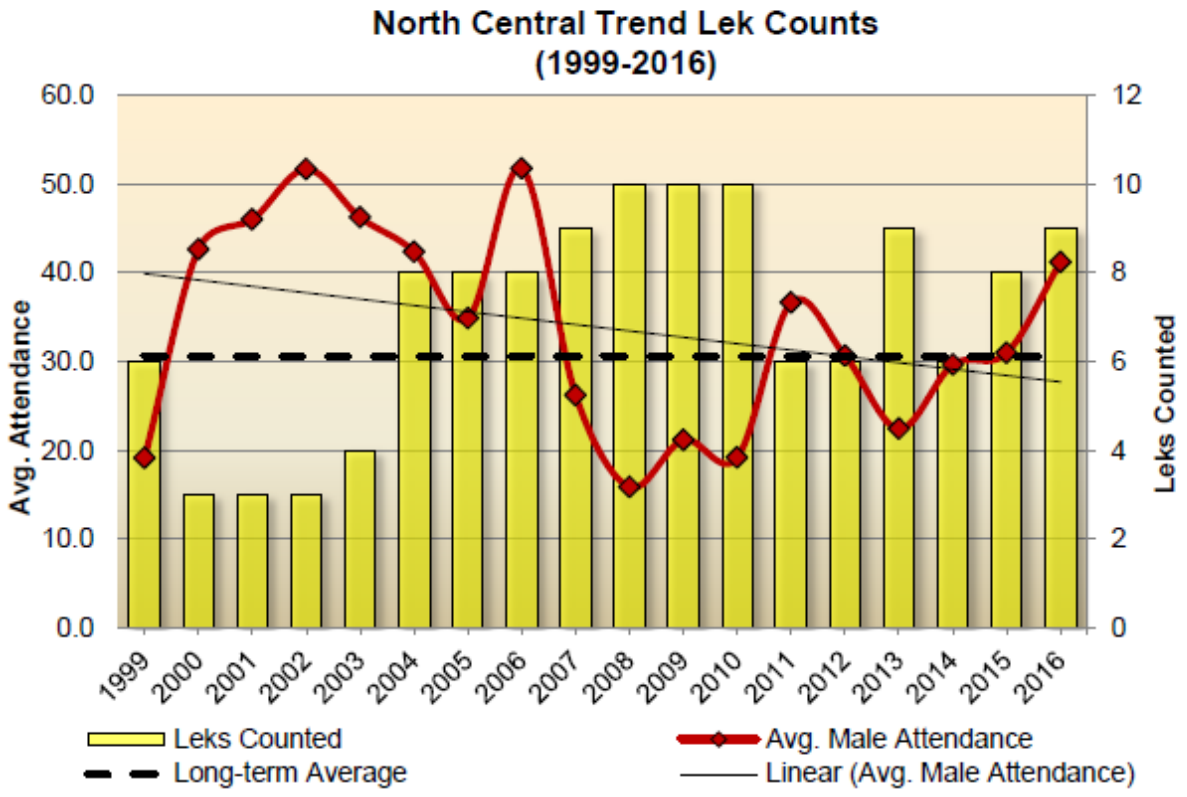


Figure 5. Trend lek attendance in the North Central Planning Area during 1999 – 2016 (NDOW 2016a).

4.2.1 Location

4.2.1.1 Black Rock BSU

The Black Rock BSU encompasses approximately 456,435 acres in Humboldt County and is located within MLRA 23 (Malheur High Plateau). It is located within WAFWA MZs III and V and includes the Black Rock, Pine Forest, and Jackson PMUs. Management of public lands is administered by the Winnemucca BLM District. The Summit Lake Indian Reservation is partially within the BSU. There are no major urban areas, highways or mines within the BSU.

4.2.1.2 Lone Willow BSU

The Lone Willow BSU encompasses approximately 509,52 acres in Humboldt County and is located within MLRA 23 (Malheur High Plateau). The Lone Willow BSU occurs within WAFWA MZ V and includes the Lone Willow PMU. The California/Oregon and the Idaho/Nevada State lines form the northern boundaries of the BSU. Management of public lands is administered by the Winnemucca BLM District and the Humboldt Toiyabe National Forest.

4.2.1.3 Northwest Interior BSU

The Northwest Interior BSU encompasses approximately 1,390,222 acres in Lander, Humboldt and Pershing Counties and is within MLRA 24 (Humboldt Area) and MLRA 27 (Fallon-Lovelock Area). The BSU occurs in WAFWA MZ III, and includes the Fish Creek, Battle Mountain, Sonoma, East Range and Humboldt PMUs. Management of public lands is administered by the Winnemucca BLM District. Interstate 80 forms a portion of the northern boundary. The cities of Winnemucca and Battle Mountain are in close proximity on the northern boundary.

4.2.1.4 Owyhee BSU

The Owyhee BSU encompasses approximately 3,582,771 acres in Lander, Humboldt, Elko and Eureka Counties and it is within MLRA 24(Humboldt Area) and MLRA 25 (Owyhee High Plateau). The Owyhee BSU is within WAFWA MZs III and IV, and includes the Desert, Tuscarora, Santa Rosa and Eden Valley PMUs. Management of public lands is administered by the Elko and Winnemucca BLM Districts and the Humboldt Toiyabe National Forest. Interstate 80 forms a portion of the southern boundary.

4.2.1.5 Pueblo Range BSU

The Pueblo Range BSU encompasses approximately 11,102 acres in Humboldt County. It is within MLRA 24 (Humboldt Area) and MLRA 23 (Malheur High Plateau). The Pueblo Range BSU is within WAFWA MZ V. Management of public lands is administered by the Winnemucca BLM District. The

city of Denio within the northeast corner of the unit. The Nevada/Oregon state line forms the northern boundary.

4.2.1.6 Western Pershing BSU

The Western Pershing BSU encompasses approximately 404,792 acres in Pershing and Humboldt Counties northwest of Lovelock and occurs within MLRA 27 (Falon-Lovelock Area). The Western Pershing BSU is located within WAFWA MZ III and includes the Majuba 1, Majuba 2, Majuba 3, Trinity 1, Trinity 2 and Eugene PMUs. Management of public lands is administered by the Winnemucca BLM District. Public lands in the BSU are managed by the Winnemucca BLM District. Private lands are within the Pershing County Conservation District.

4.2.2 Threat Assessment

4.2.2.1 North Central Planning Area

Threats to the BSUs within the North Central Planning Area are listed in Table 2. The region has been impacted by significant wildfire and invasion of annual grasses and noxious weeds. Much of the lower elevation areas (<6,000 ft) within the Planning Area has burned and been converted to cheatgrass, and post-fire seeding efforts have largely been unsuccessful due to frequent re-burns and environmental variability (Sage-grouse Conservation Team 2004). In the Lone Willow BSU, the 2012 Holloway fire burned approximately 214,000 acres in Nevada and 460,000 acres including the adjacent Oregon population. In 1999, the Poker Brown fire burned approximately 232,000 acres within the Majuba and Trinity PMUs that converted the area from a Wyoming sagebrush, salt desert shrub community to a cheatgrass monoculture.

The Northwest Interior and Western Pershing BSUs contain relatively small populations that are more susceptible to loss of habitat and connectivity by wildfire, and the lack of habitat recovery has resulted in extirpation of GRSG in some areas. Habitat loss and conversion, and potential loss of population connectivity are also concerns for the Lone Willow BSU. In all BSUs, improper livestock grazing and overutilization by wild horses and burros have resulted in habitat degradation. Lone Willow BSU is the only unit that does not contain WHB Management Areas. Mining, energy exploration, and recreation are prevalent in some areas. Conifer encroachment is restricted to the Fish Creek and Battle Mountain PMUs within the Northwestern Interior BSU.

Table 2. Summary of threats to Greater Sage-grouse within the North Central Planning Area by PMU. Threat assessment information acquired from the Greater Sage-grouse Conservation Plan for Nevada and California[1] (Sage-grouse Conservation Team 2004) and the COT Final Report[2] (USFWS 2013). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	Threat Level by PMU		
	Black Rock/Lone Willow/Pueblo Range BSUs	**Northwest Interior/Western Pershing BSUs**	**Owyhee BSU[2]**
Isolated/Small Size	N[2]	Y[1,2]	N
Sagebrush Elimination	L[2]	N[2]	L
Agricultural Conversion	L[2]	N[2]	L
Fire	Y[1,2]	Y[1,2]	Y
Conifers	L[1]	Y[1,2]	Y
Weeds/Annual Grasses	Y[1,2]	Y[1,2]	Y
Energy	L[2]	U	L
Mining	L[1,2]	Y[1,2]	L
Infrastructure	L[2]	Y	Y
Grazing	Y[1,2]	Y	Y
Free-Roaming Equids	Y[1,2]	Y	L
Recreation	Y[1]	Y[1,2]	Y
Urbanization	N[1,2]	N	Y
Predation	U[1]	U	U

4.2.2.2 Proposed and completed conservation actions for sage-grouse

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf

- North Central Local Area Conservation Plan and Population Management Unit Plans

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/North-Central-LACP-PMU-Plans.pdf

- Nevada Sage-Grouse Conservation Project

http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.2.3 Key Conservation Strategies for the North Central Planning Area

4.2.3.1 General Management Guidelines

- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.
- Develop a public outreach and educational component for both anticipated and completed projects.

4.2.3.2 Priority Conservation Strategies

North Central Planning Area

- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Focus efforts to stop advancement of invasive and noxious annual grasses
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Manage livestock grazing in a sustainable, adaptive approach to promote successful re-establishment of planted vegetation following wildfire.
- Manage livestock grazing in a sustainable, adaptive approach to maintain or enhance habitat conditions within the SGMAs.

Black Rock/Lone Willow/Pueblo Range BSUs

- Identify areas for Phase I and II P-J removal in SGMAs.

- Encourage and support management of wild horse and burro populations at AML.

Northwest Interior and Western Pershing BSUs

- Focus habitat restoration projects on movement corridors that have been degraded due to wildfire or P-J encroachment to maintain connectivity between small and isolated populations.
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.
- Encourage and support management of wild horse and burro populations at AML.

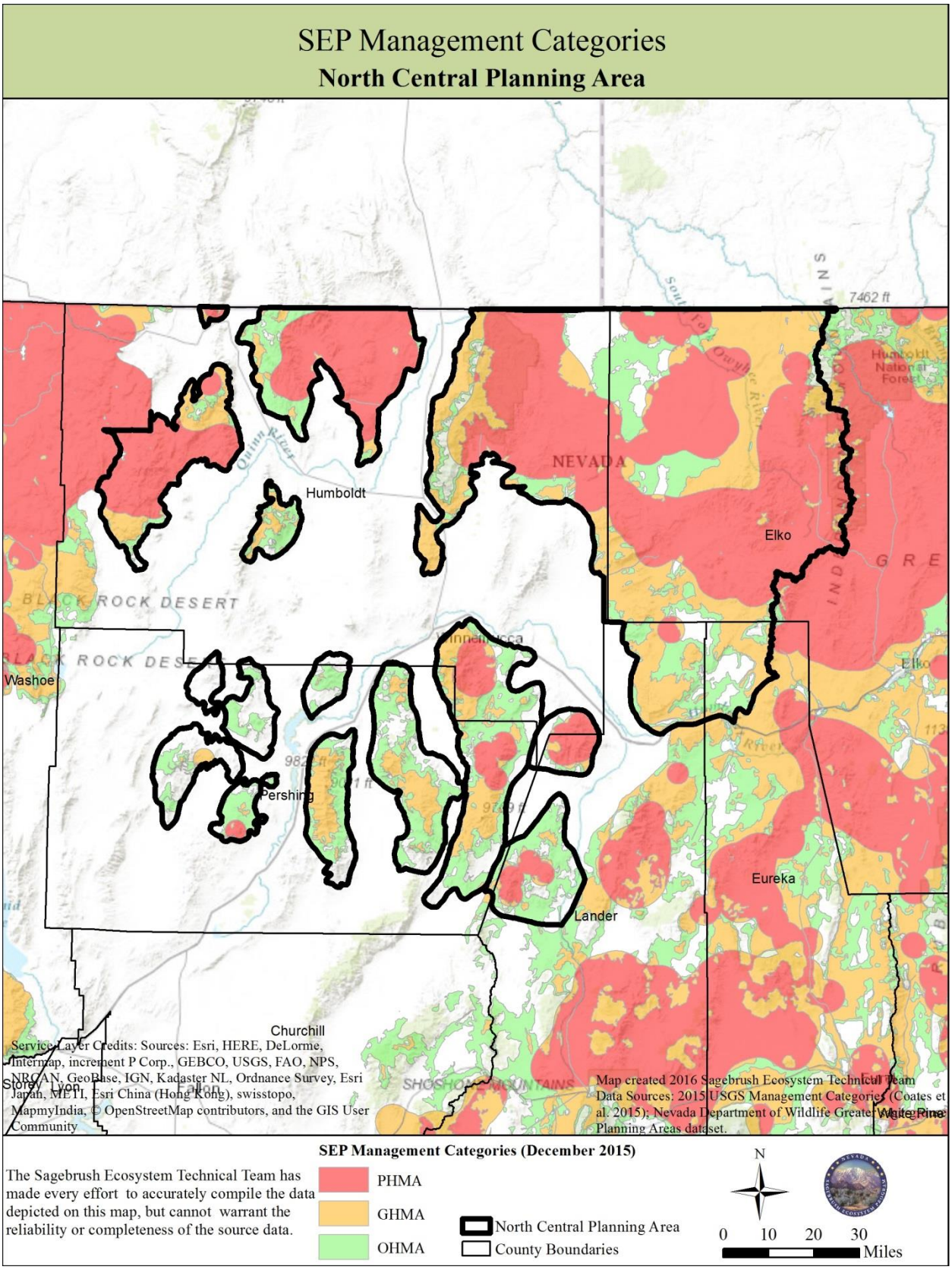
4.2.3.3 Secondary Conservation Strategies

Black Rock/Lone Willow/Pueblo Range BSUs

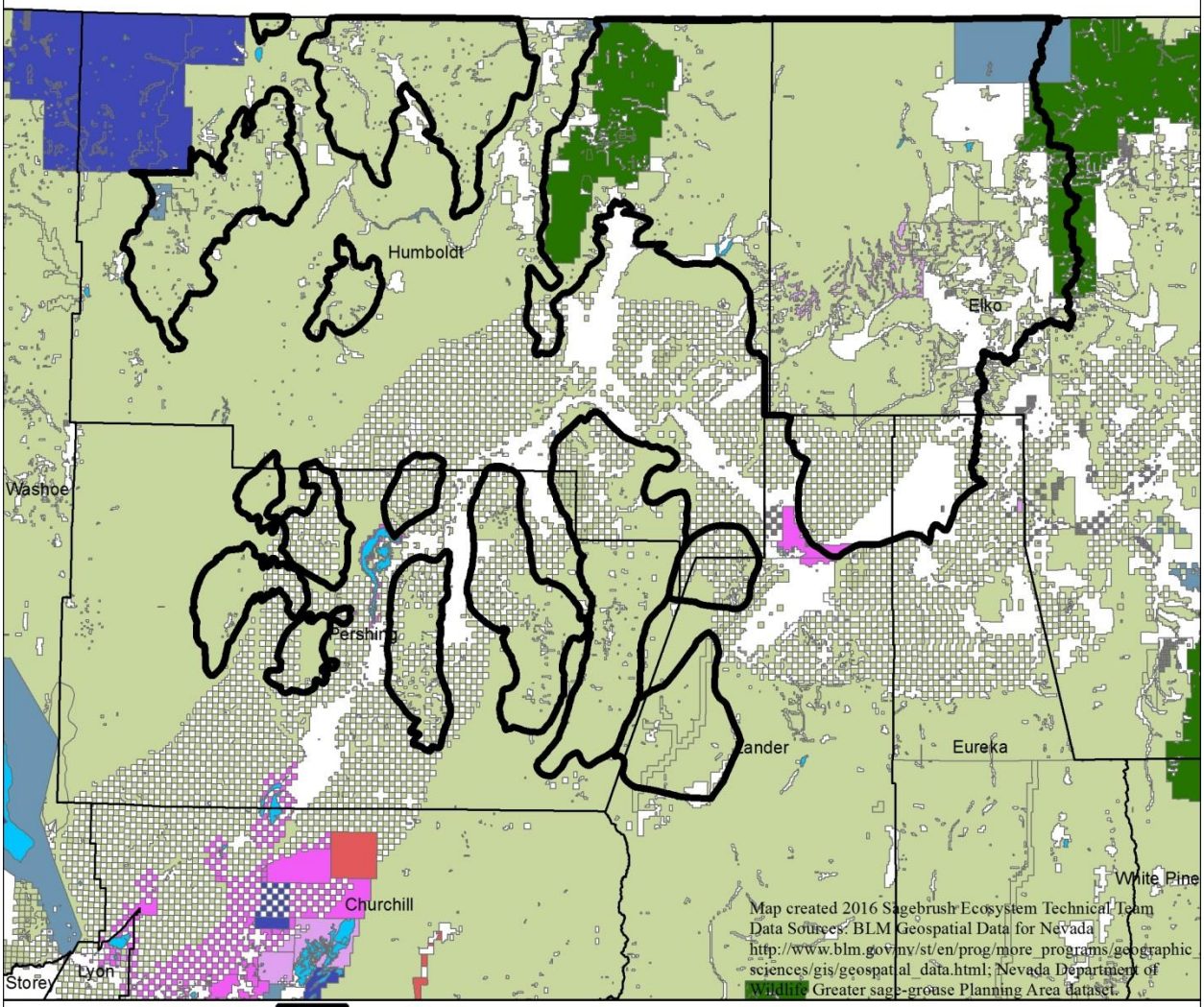
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).

Owyhee BSU

- Encourage and support management of wild horse and burro populations at AML.
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.


SEP Management Categories
North Central Planning Area
NEVADA
Humboldt
Elko
Washoe
Pershing
Eureka
Lander
Churchill
Storey
Lyon
Esmeralda
Mineral
White Pine
BLACK ROCK DESERT
Humboldt National Forest
7462 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater Sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
North Central Planning Area
County Boundaries
N
0 10 20 30
Miles

Land Ownership
North Central Planning Area

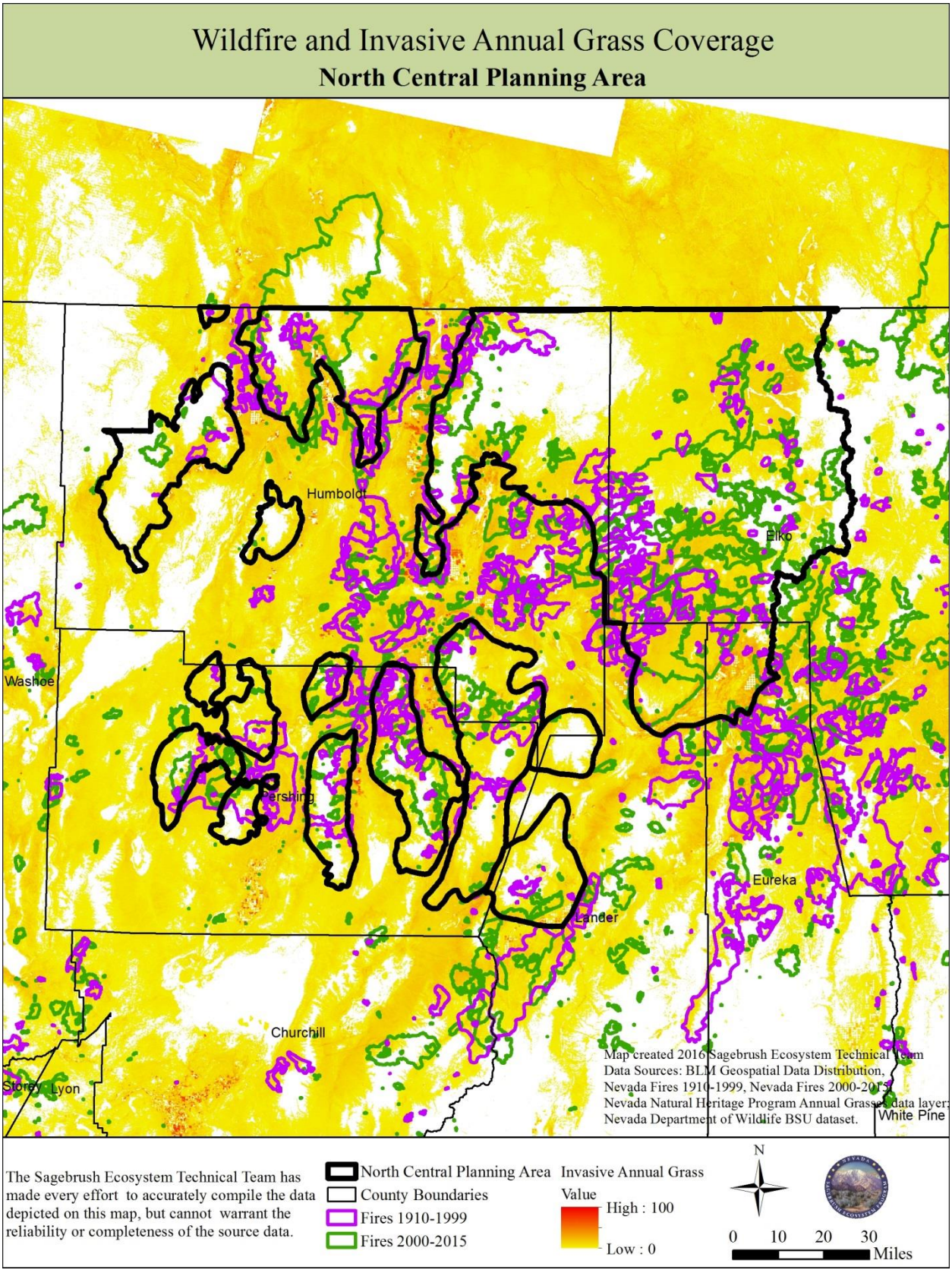


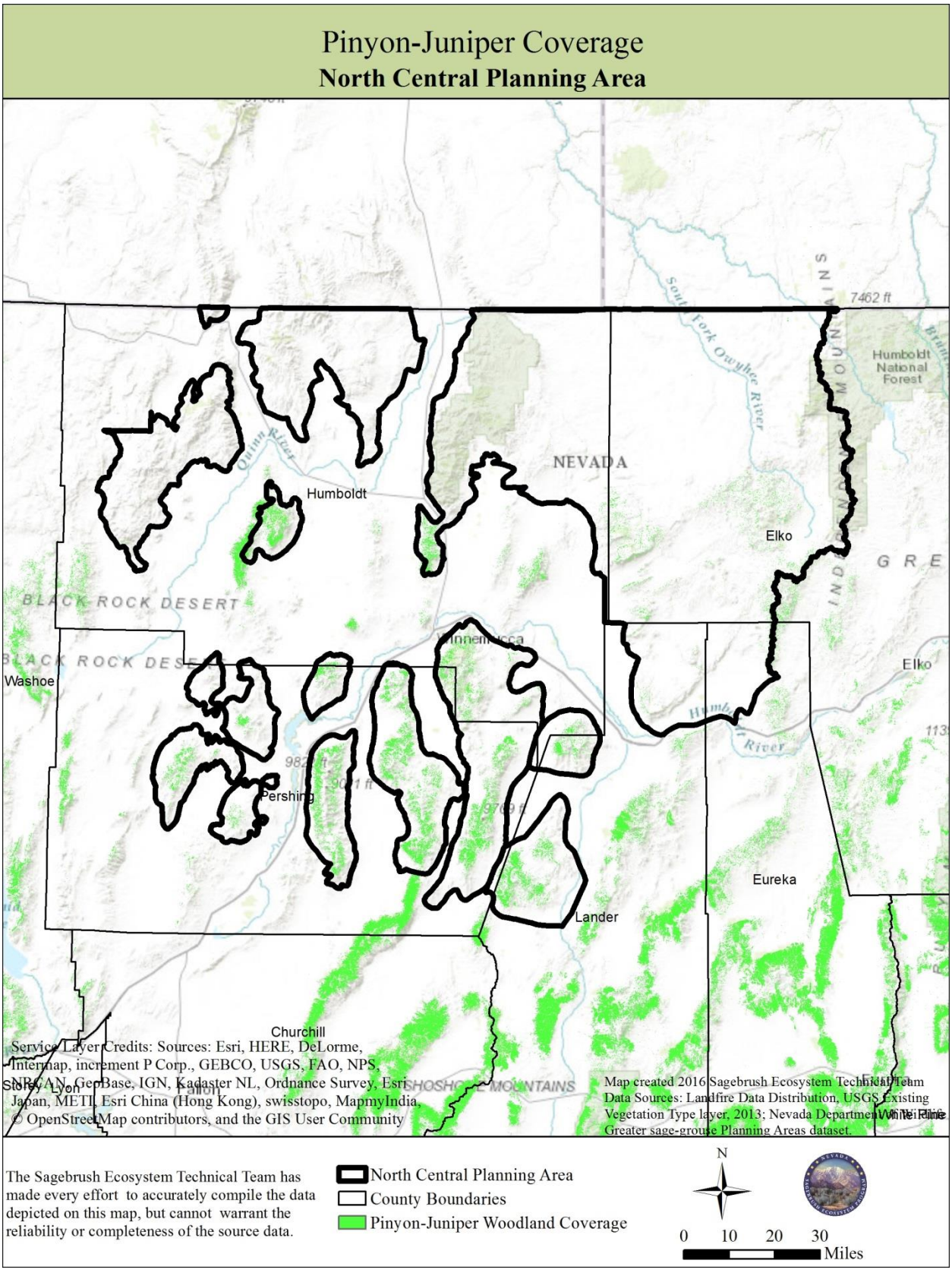
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

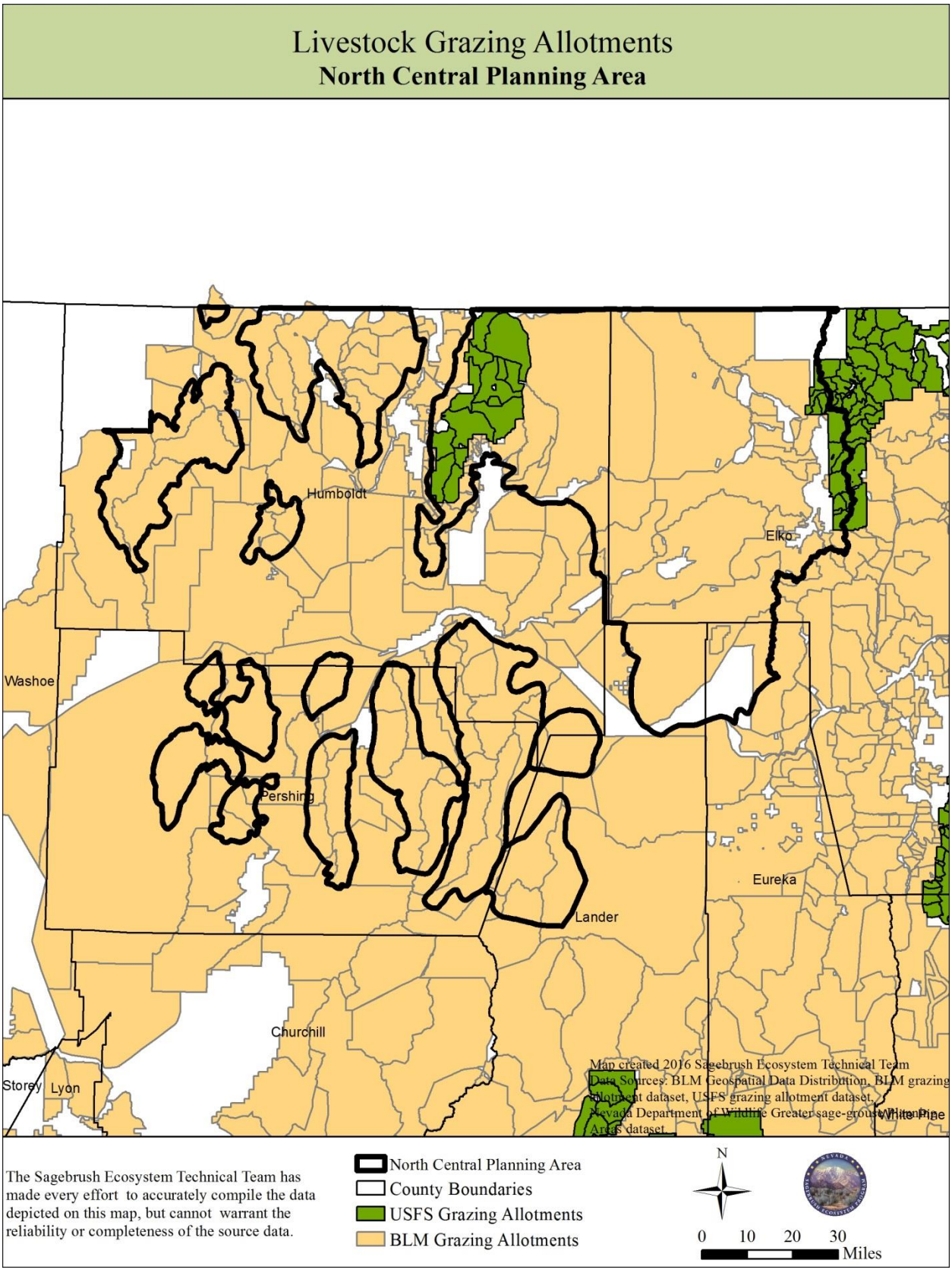
- North Central Planning Area
- County Boundaries
- BSU Boundary
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Department of Energy
- Department of Energy
- Fish and Wildlife Service
- Forest Service
- National Park Service
- Nevada State
- Private
- Regional Park
- Water

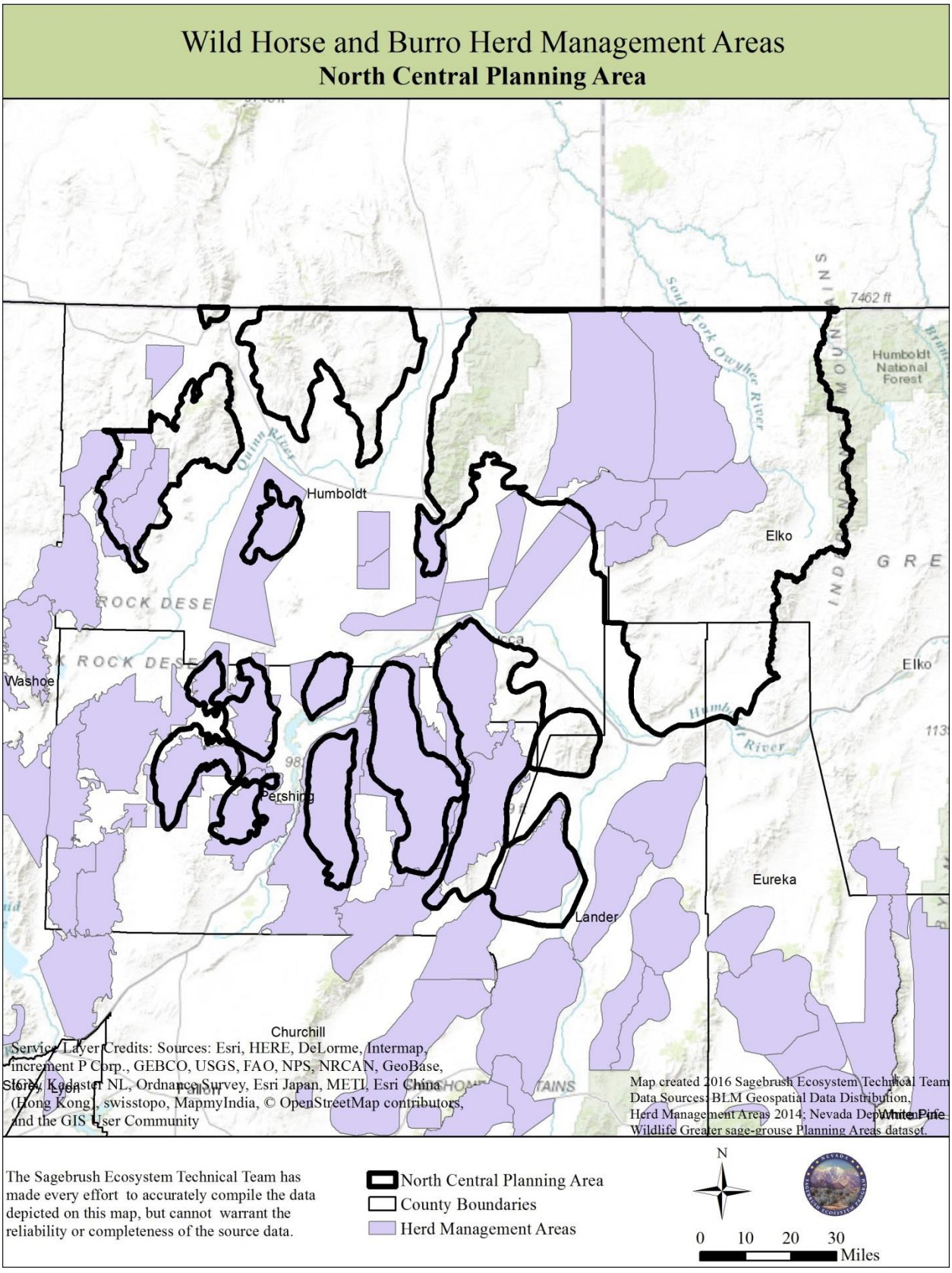
N

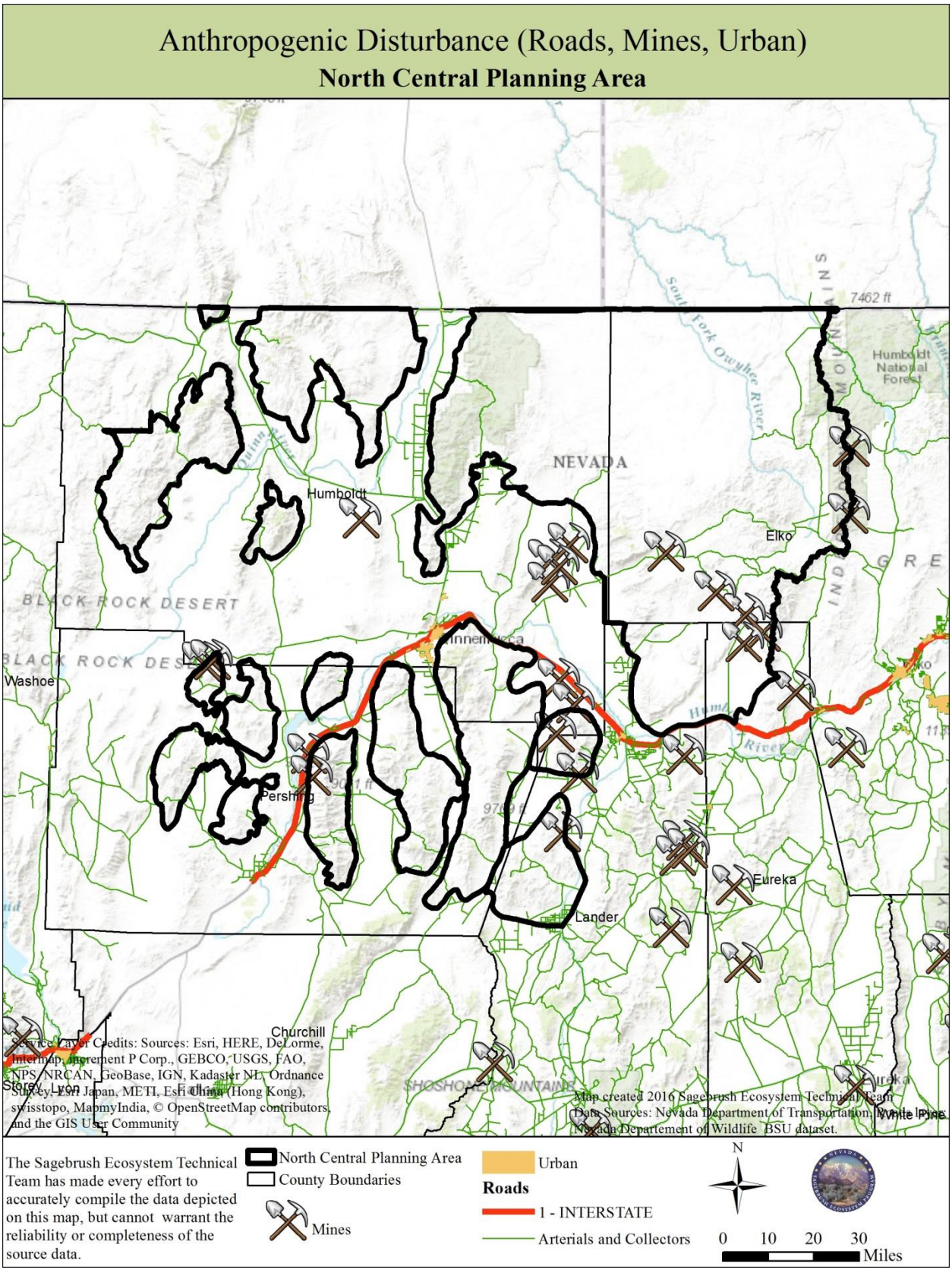
0 10 20 30 Miles


Wildfire and Invasive Annual Grass Coverage
North Central Planning Area
Humboldt
Elko
Washoe
Pershing
Eureka
Lander
Churchill
Storey
Lyon
White Pine
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015,
Nevada Natural Heritage Program Annual Grasses data layer,
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
North Central Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass Value
High : 100
Low : 0
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
North Central Planning Area
NEVADA
Humboldt
Elko
Washoe
Pershing
Lander
Eureka
Churchill
Humboldt National Forest
7462 ft
BLACK ROCK DESERT
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
North Central Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Livestock Grazing Allotments
North Central Planning Area
Humboldt
Elko
Washoe
Pershing
Eureka
Lander
Churchill
Storey
Lyon
White Pine
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Area dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
North Central Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
North Central Planning Area
7462 ft
Humboldt National Forest
South Fork Owyhee River
Quinn River
Humboldt
Elko
Washoe
Pershing
Lander
Eureka
Churchill
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Dep
Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
North Central Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
North Central Planning Area
NEVADA
Humboldt
Elko
Washoe
Pershing
Lander
Eureka
Churchill
Storey
Lyon
White Pine
Humboldt National Forest
BLACK ROCK DESERT
7462 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
North Central Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles

4.3 SOUTH CENTRAL PLANNING AREA

The South Central Planning Area occurs within WAFWA MZ III and is comprised of three Biologically Significant Units: the Central Great Basin, Monitor, and Smith/Reese Units. Trend lek attendance for the Planning Area is provided in Figure 6. Much of the South Central Planning Area is drier than other parts of Nevada and is characterized by salt desert scrub communities along valley bottoms that transitions to large expanses of sagebrush covered benches. The mountain big sagebrush and shrub community at higher elevations provide important brood-rearing (and nesting) habitat for populations in this region. The primary threat identified within the South Central Planning Area includes extensive P-J encroachment, which dominates the mid-elevation ranges. Wildfire and invasive annual grasses are also significant threats. Improper livestock grazing, wild horse and burro overutilization, mineral exploration and extraction and associated infrastructure are also threats present within the region.

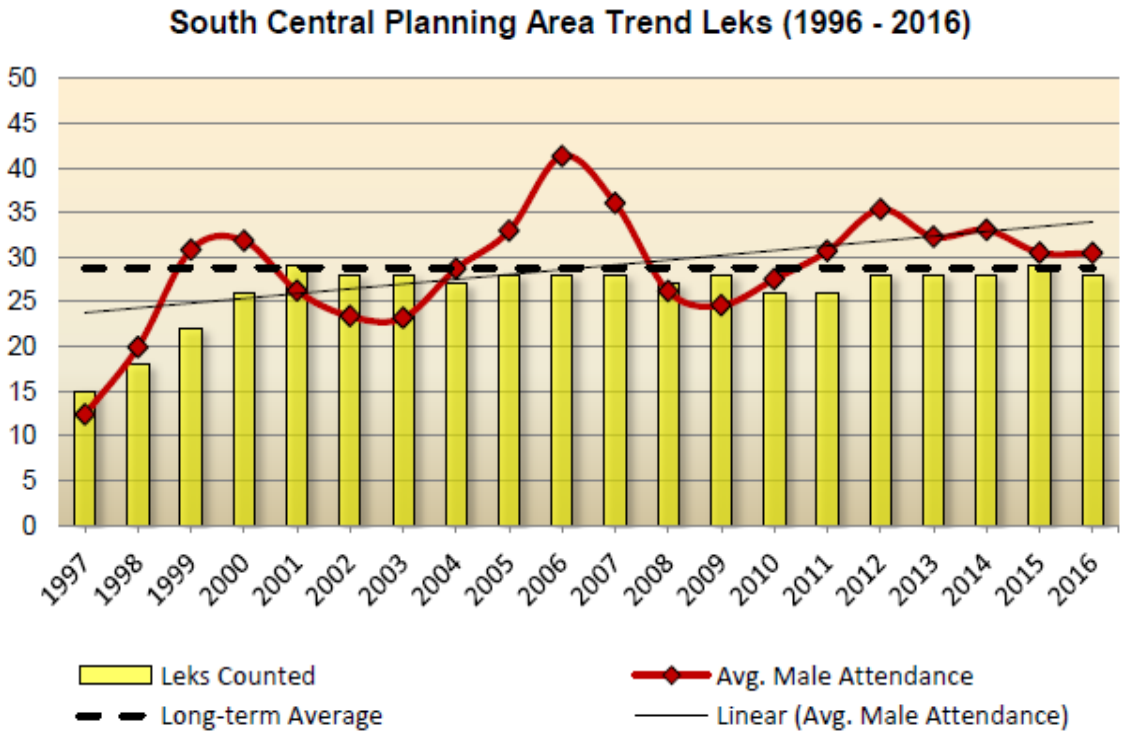


Figure 6. Trend lek attendance in the South Central Planning Area during 1996 – 2016 (NDOW 2016a).

4.3.1 Location

4.3.1.1 Central Great Basin BSU

The Central Great Basin BSU encompasses approximately 4,053,152 acres in Lander and Eureka Counties and is located within MLRA 28B (Central Nevada Basin and Range), MLRA 25 (Owyhee High Plateau) and MLRA 24 (Humboldt Area). It is the largest BSU in Nevada and includes the Shoshone, Cortez, Diamond, Three Bar and Toiyabe PMUs. Management of public lands is administered by the Elko, Battle Mountain and Ely BLM Districts and the Humboldt Toiyabe National Forest. The city of Carlin and Interstate 80 form a portion of the northern boundary of the BSU, and Austin and Eureka are located within the BSU.

4.3.1.2 Monitor BSU

The Monitor BSU encompasses approximately 3,629,150 acres in Lander, Eureka and Nye Counties, and is located within MLRA 28B (Central Nevada Basin and Range) and MLRA 29 (Southern Nevada Basin and Range). The Monitor BSU includes the Monitor and Kawich PMUs. Management of public lands is administered by the Battle Mountain, Southern Nevada and Ely BLM Districts and the Humboldt Toiyabe National Forest.

4.3.1.3 Smith/Reese BSU

The Smith/Reese BSU encompasses approximately 2,370,085 acres in Nye, Lander and Churchill Counties. It is within MLRA 28B (Central Nevada Basin and Range), MLRA 27 (Falon-Lovelock Area) and MLRA 24 (Humboldt Area). The BSU includes the Reese River, Desatoya and Clan Alpine PMUs. Management of public lands is administered by the Battle Mountain and Carson City BLM Districts and the Humboldt Toiyabe National Forest.

4.3.2 Threat Assessment

4.3.2.1 South Central Planning Area

Threats to the South Central Planning Area are listed in Table 3. The major threat to GRSG within this Planning Area is conversion of sagebrush communities to P-J woodlands. As P-J transitions to Phases II and III, habitat restoration and recovery becomes more difficult as the shrub, grass, and forb components are displaced. Wildfire and cheatgrass invasion are also important threats and are more prevalent in the Central Great Basin BSU than other BSUs within the South Central Planning Area. Other threats include mining, infrastructure, recreation, and overgrazing by livestock and horses.

The Clan Alpine PMU is comprised of small populations, but they are well connected to other populations in the region and are considered stable. However, peripheral populations have a higher risk of extirpation from chance events and major disturbances. Threats from predation and recreation are considered low. Improper livestock management and grazing from feral horses are considered low to moderate risks, but these threats will increase if not properly managed. Invasive grass and weeds are present within the Desatoya and Clan Alpine PMUs but are primarily point infestations, which is expected to increase over time following disturbance. Grazing is managed on a rotational management system within the Desatoya PMU, however wild horses are above AML and overgrazing and trampling by feral horses is a significant threat to GRSG habitat. Predation from aerial predators (ravens and raptors) is also thought to be increasing but is lacking scientific information.

Table 3. Summary of threats to Greater Sage-grouse within the South Central Planning Area. Threat assessment information acquired from the Greater Sage-grouse Conservation Plan for Nevada and California[1] (Sage-grouse Conservation Team 2004) and the COT Final Report[2] (USFWS 2013). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	**Threat Level**		
	Clan Alpine PMU	**Desatoya PMU**	**Rest of South Central Planning Area[2]**
Isolated/Small Size	L[1]	N[1]	L
Sagebrush Elimination	L[2]	L[2]	L
Agricultural Conversion	L[2]	L[2]	L
Fire	Y[1,2]	L[1]	Y
Conifers	Y[1,2]	Y[1,2]	Y
Weeds/Annual Grasses	Y[2]	Y[2]	Y
Energy	L[2]	L[2]	L
Mining	L[1,2]	L[1,2]	L
Infrastructure	Y[2]	Y[2]	Y
Grazing	L[1]	L[1]	Y
Free-Roaming Equids	Y[1,2]	Y[1,2]	Y
Recreation	L[1]	L[1]	Y
Urbanization	N[1,2]	N[1,2]	N
Predation	L[1]	Y[1]	U

4.3.2.2 Proposed and completed conservation actions for sage-grouse

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf

- The South Central Nevada Sage Grouse Conservation Plan

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/South-Central-Plan.pdf

- Nevada Sage-Grouse Conservation Project

  http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.3.3 Key Conservation Strategies for the South Central Planning Area

4.3.3.1 General Management Guidelines

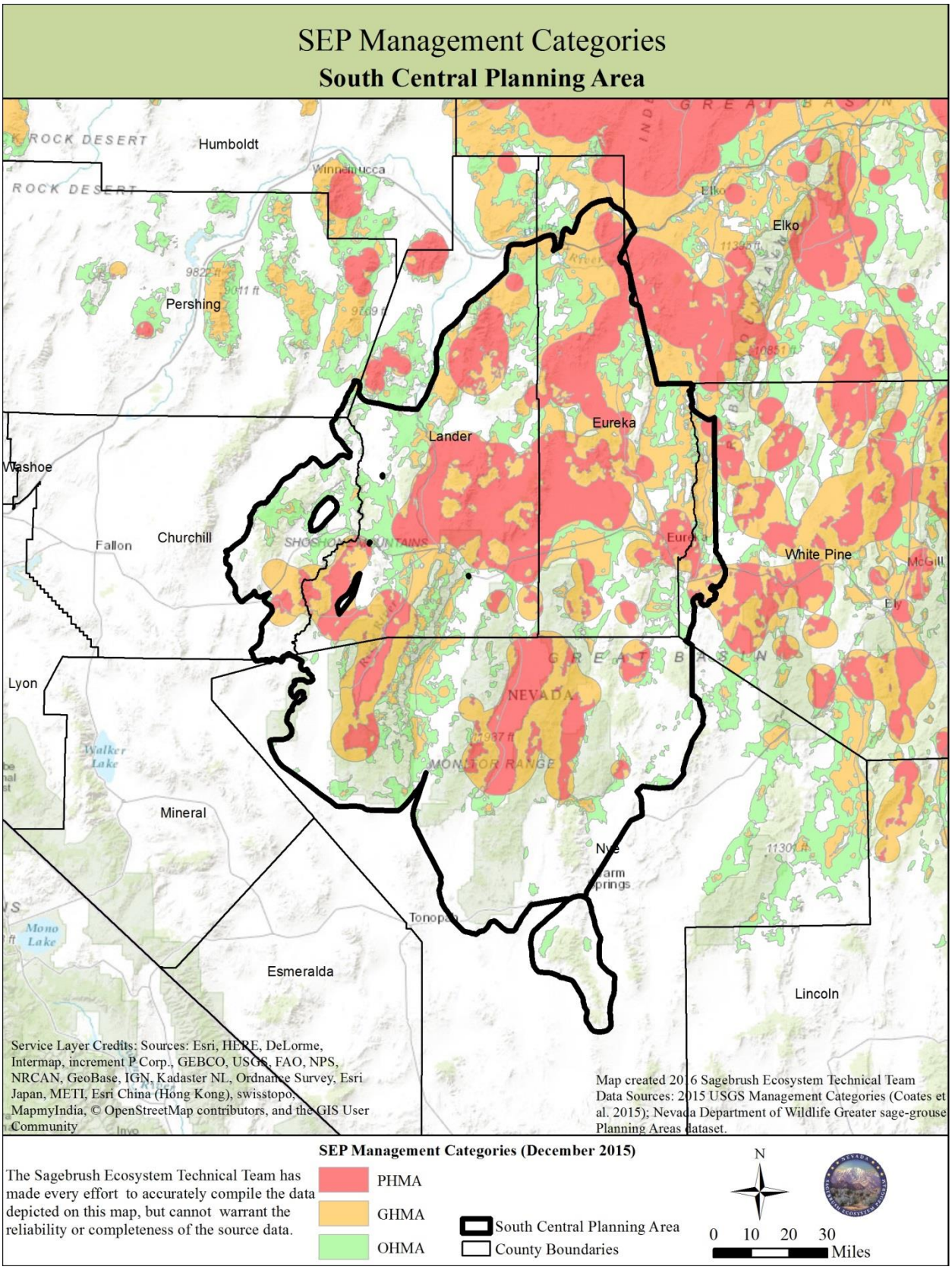
- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.
- Develop a public outreach and educational component for both anticipated and completed projects.

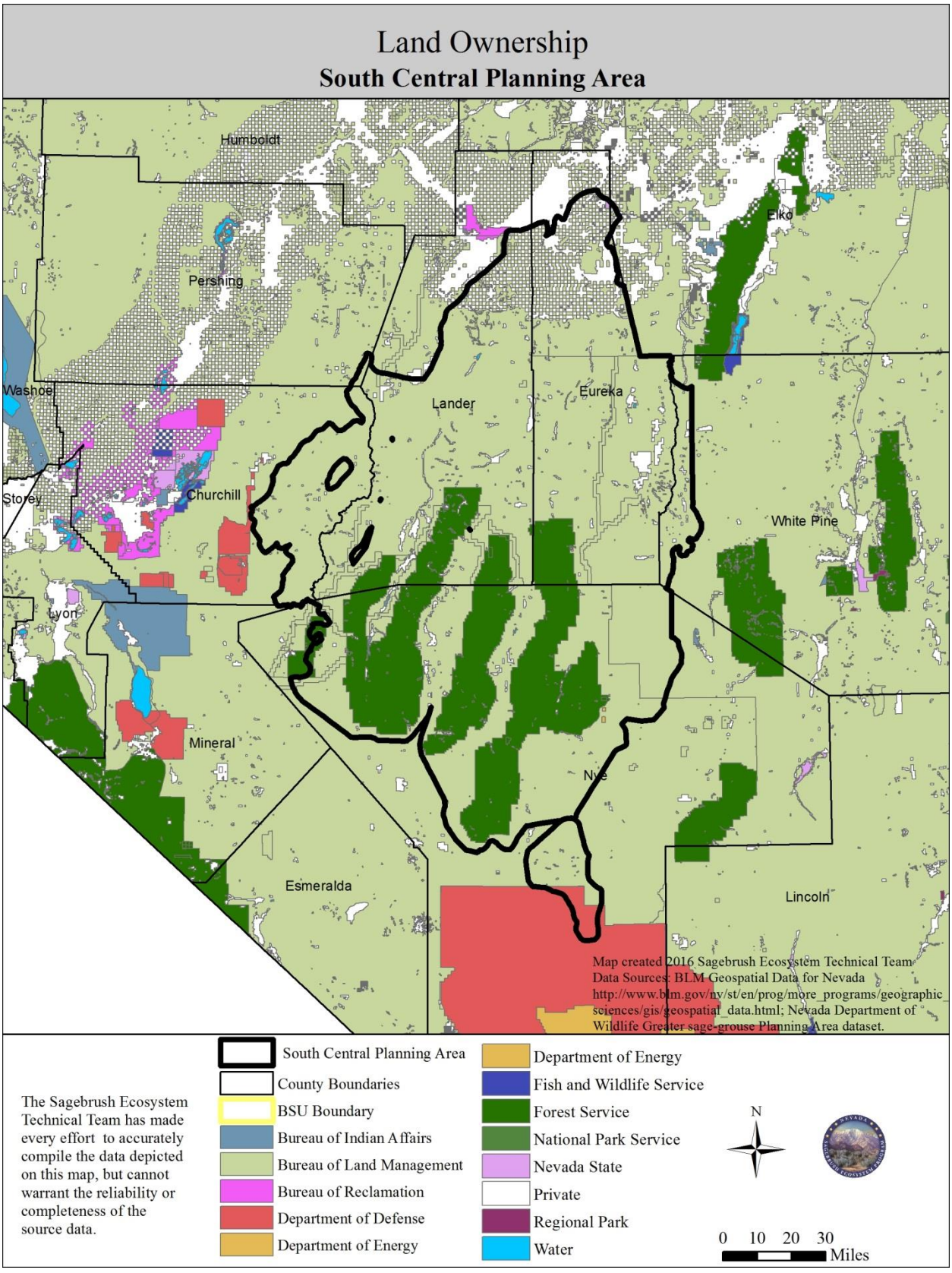
4.3.3.2 Priority Conservation Strategies

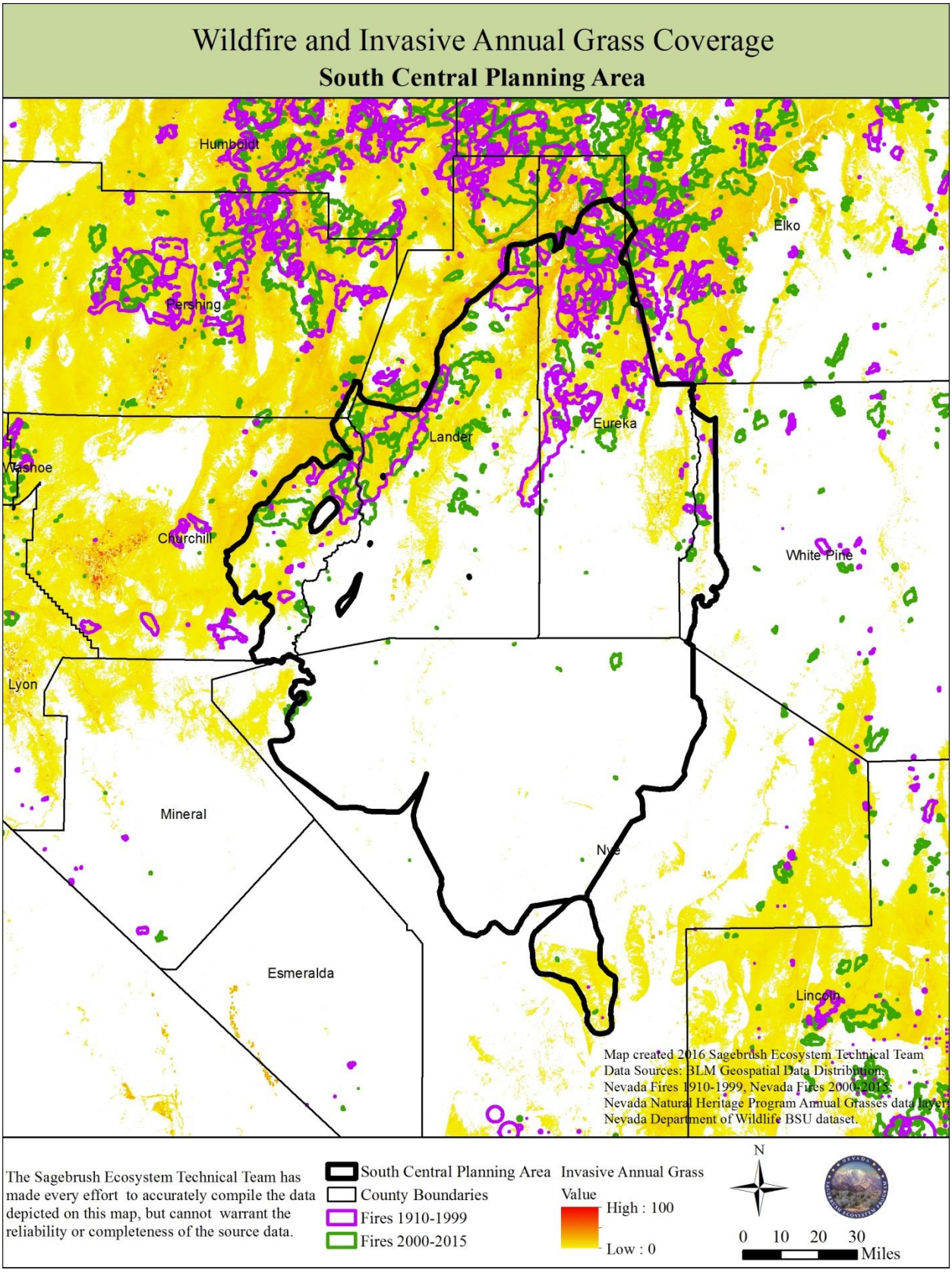
South Central Planning Area

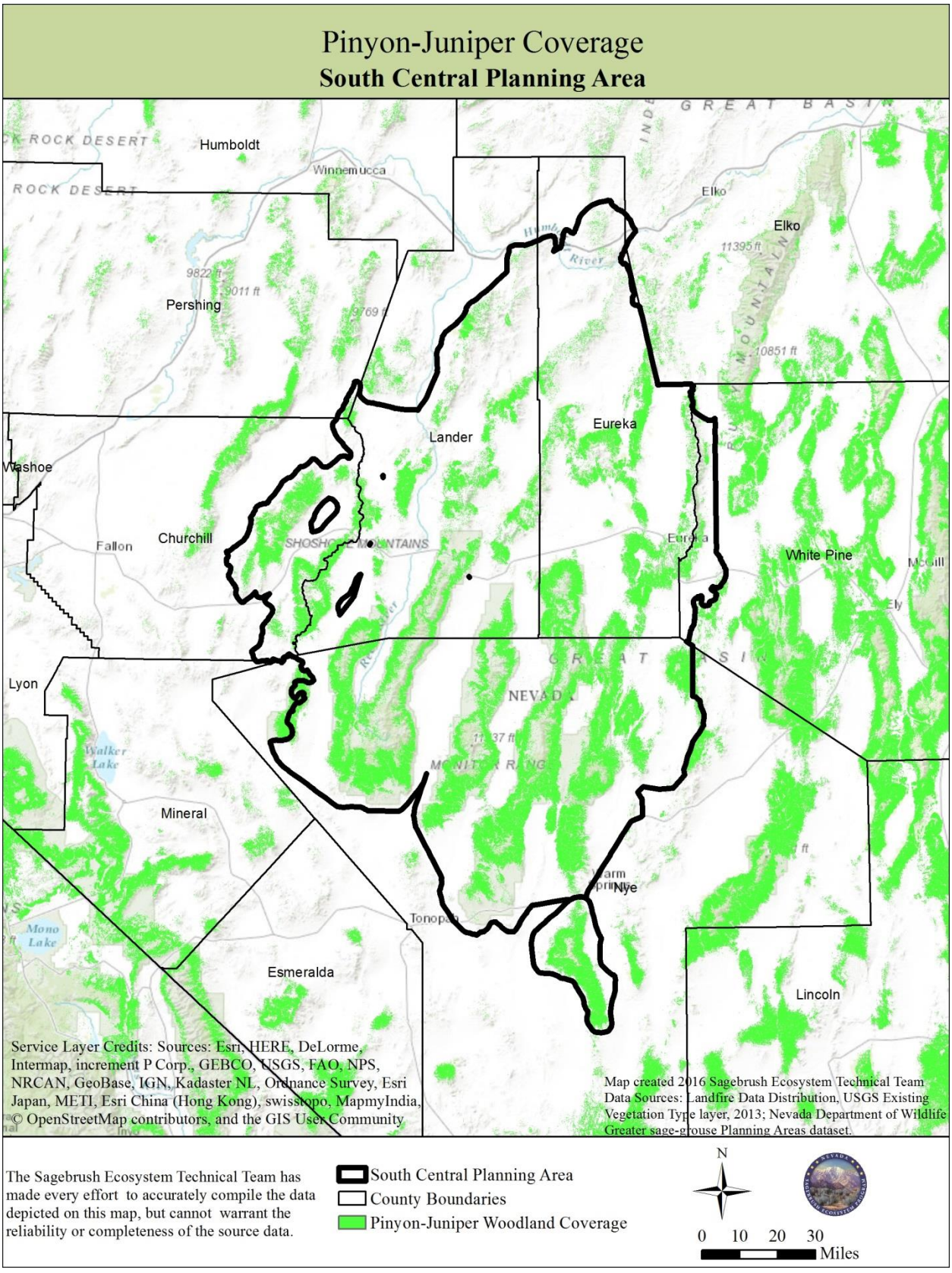
- Prioritize phase I and II P-J removal treatments in SGMAs, particularly near meadow and riparian areas that can be most negatively impacted by conifer encroachment due to high amount of water consumption by P-J trees (citation).
- Protect and enhance late brood-rearing habitats (i.e., riparian areas, corridors from low to higher elevation meadow habitats).
- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Focus efforts to stop advancement of invasive and noxious annual grasses

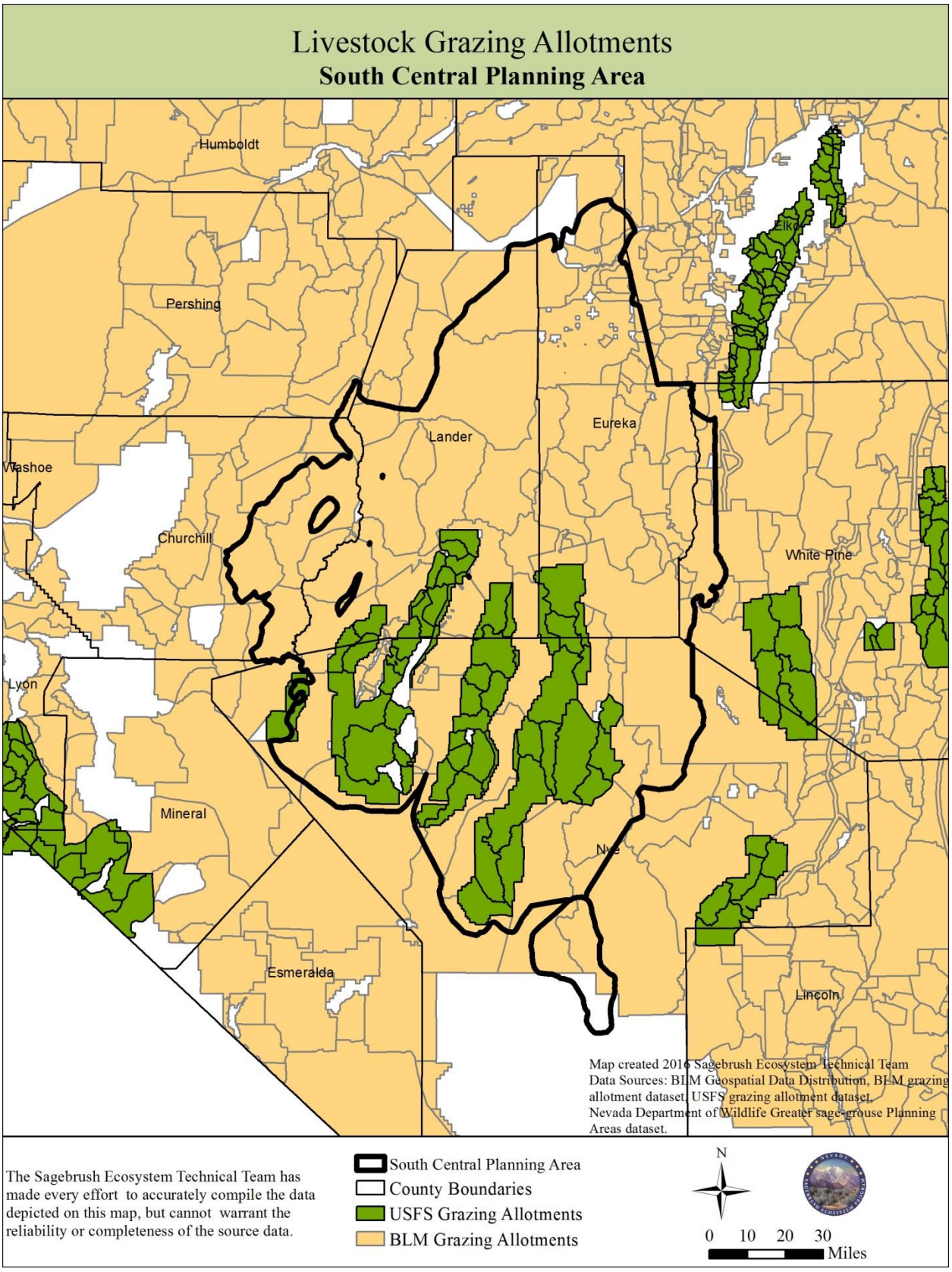
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.

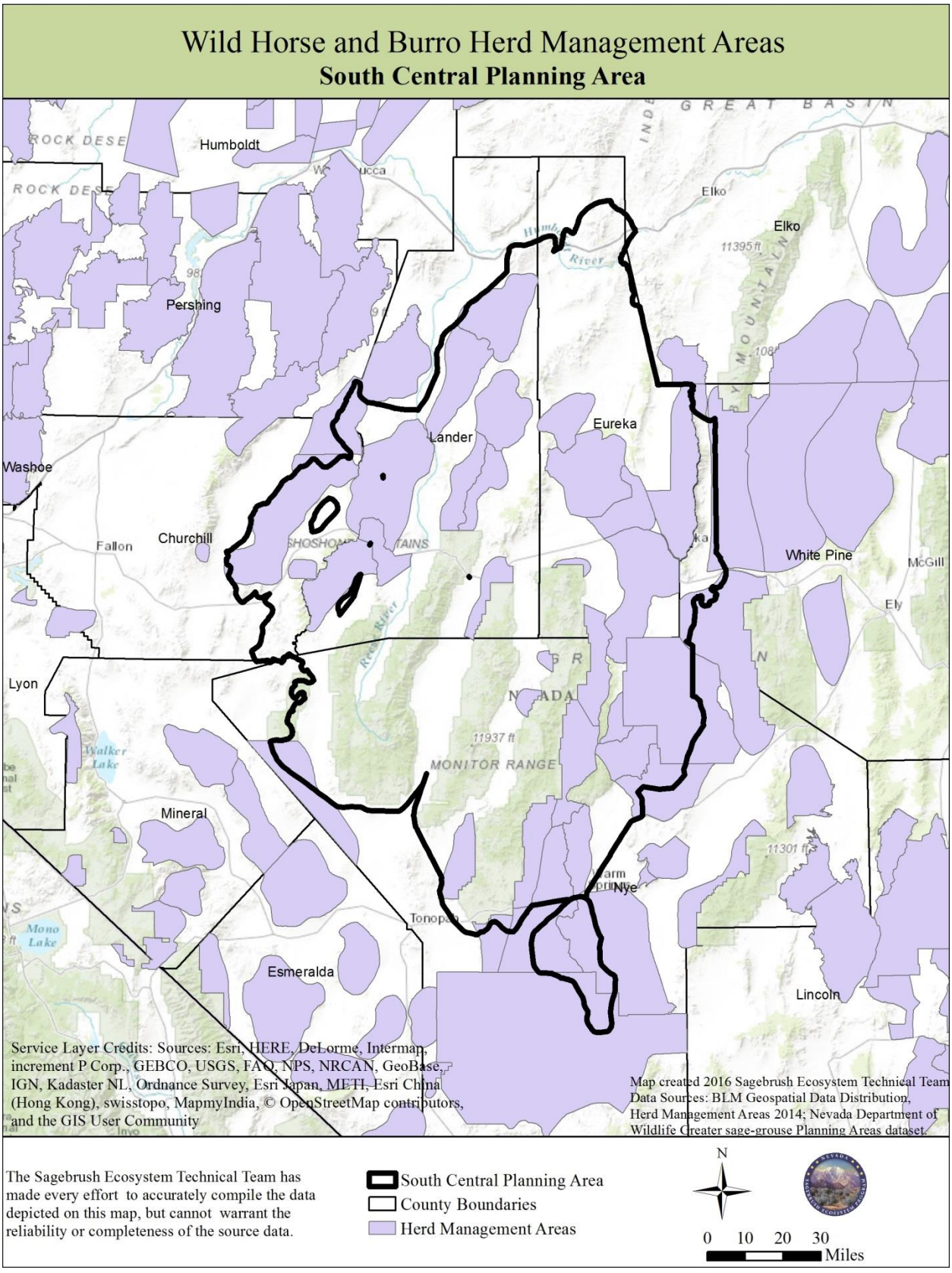

SEP Management Categories
South Central Planning Area
Humboldt
Winnemucca
Elko
Pershing
Eureka
Lander
Washoe
Churchill
Fallon
White Pine
Lyon
Mineral
Nye
Esmeralda
Lincoln
NEVADA
GREAT BASIN
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
South Central Planning Area
County Boundaries
N
0 10 20 30
Miles

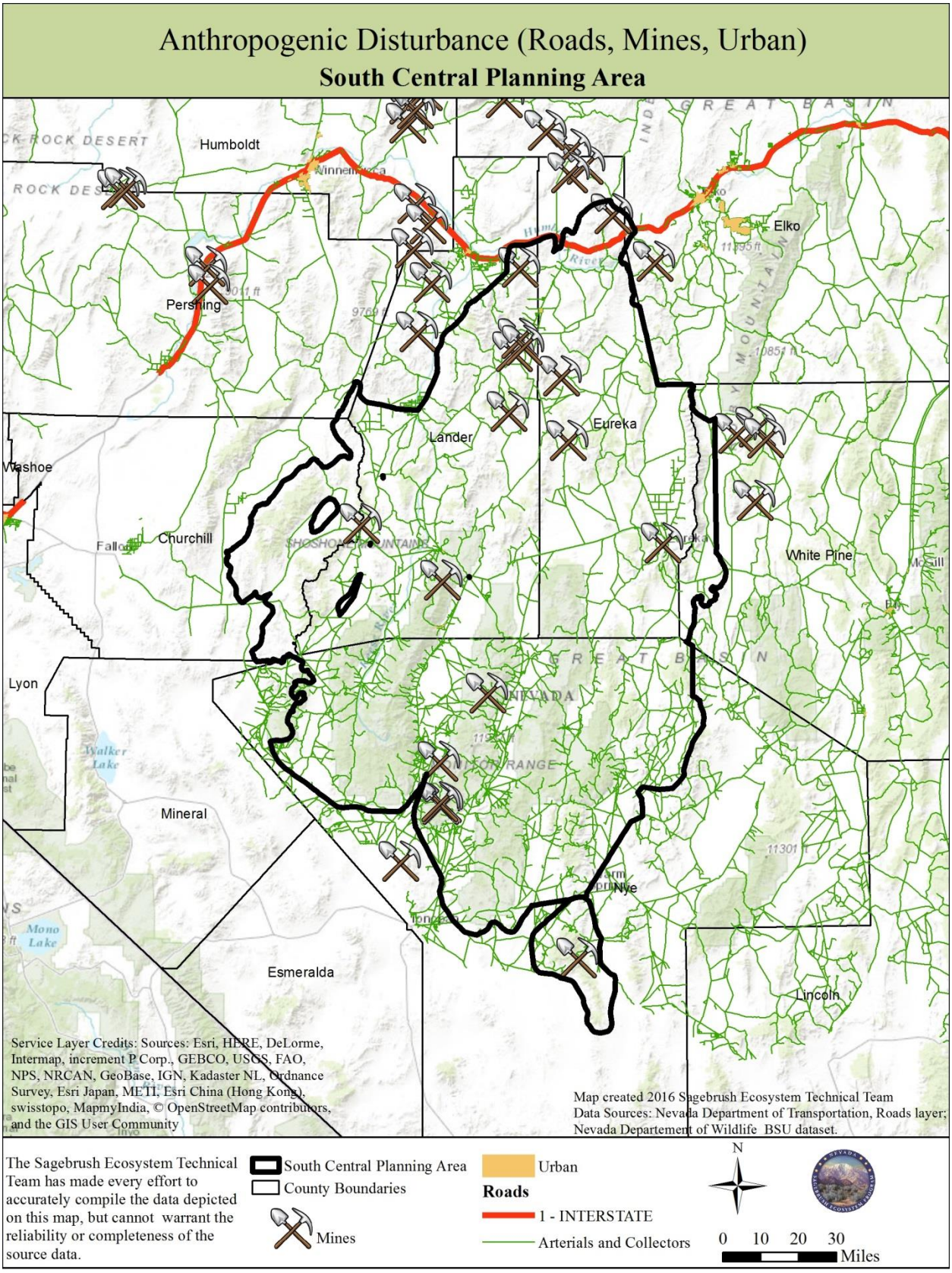

Land Ownership
South Central Planning Area
Humboldt
Elko
Pershing
Washoe
Lander
Eureka
Storey
Churchill
White Pine
Lyon
Mineral
Nye
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife Greater sage-grouse Planning Area dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles


Wildfire and Invasive Annual Grass Coverage
South Central Planning Area
Humboldt
Elko
Pershing
Lander
Eureka
Washoe
Churchill
White Pine
Lyon
Mineral
Nye
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015,
Nevada Natural Heritage Program Annual Grasses data layer,
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass Value
High : 100
Low : 0
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
South Central Planning Area
Humboldt
Winnemucca
Elko
Pershing
Lander
Eureka
Washoe
Churchill
Fallon
White Pine
Lyon
NEVADA
Mineral
Nye
Esmeralda
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Livestock Grazing Allotments
South Central Planning Area
Humboldt
Pershing
Lander
Eureka
Elko
Washoe
Churchill
White Pine
Lyon
Mineral
Nye
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
South Central Planning Area
Humboldt
Elko
Pershing
Lander
Eureka
Washoe
Churchill
Fallon
White Pine
McGill
Ely
Lyon
Mineral
Nye
Esmeralda
Lincoln
Tonopah
11937 ft
MONITOR RANGE
11395 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
South Central Planning Area
Humboldt
Elko
Pershing
Lander
Eureka
Washoe
Churchill
White Pine
Lyon
Mineral
Nye
Esmeralda
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Roads layer; Nevada Departement of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
South Central Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles

4.4 ELKO PLANNING AREA

The Elko Planning Area occurs within WAFWA MZs III and IV and is comprised of four Biologically Significant Units: the Central Elko, East High Desert, Northeast Elko, and Ruby Units. Trend lek attendance for the Planning Area is provided in Figure 7. The Elko Planning Area, in conjunction with the Owyhee BSU, represents the largest contiguous concentration and likely the largest population of GRSG in Nevada. Wildfire and invasive annual grass present a significant threat to populations within the Elko Planning Area. However, restoration efforts generally have a higher chance of success due to greater R&R characteristics in the region; sagebrush, native grasses and forbs are more likely to return with proper post-fire management treatments. Additional threats include nest depredation by ravens, improper livestock grazing, mining, and OHV recreation.

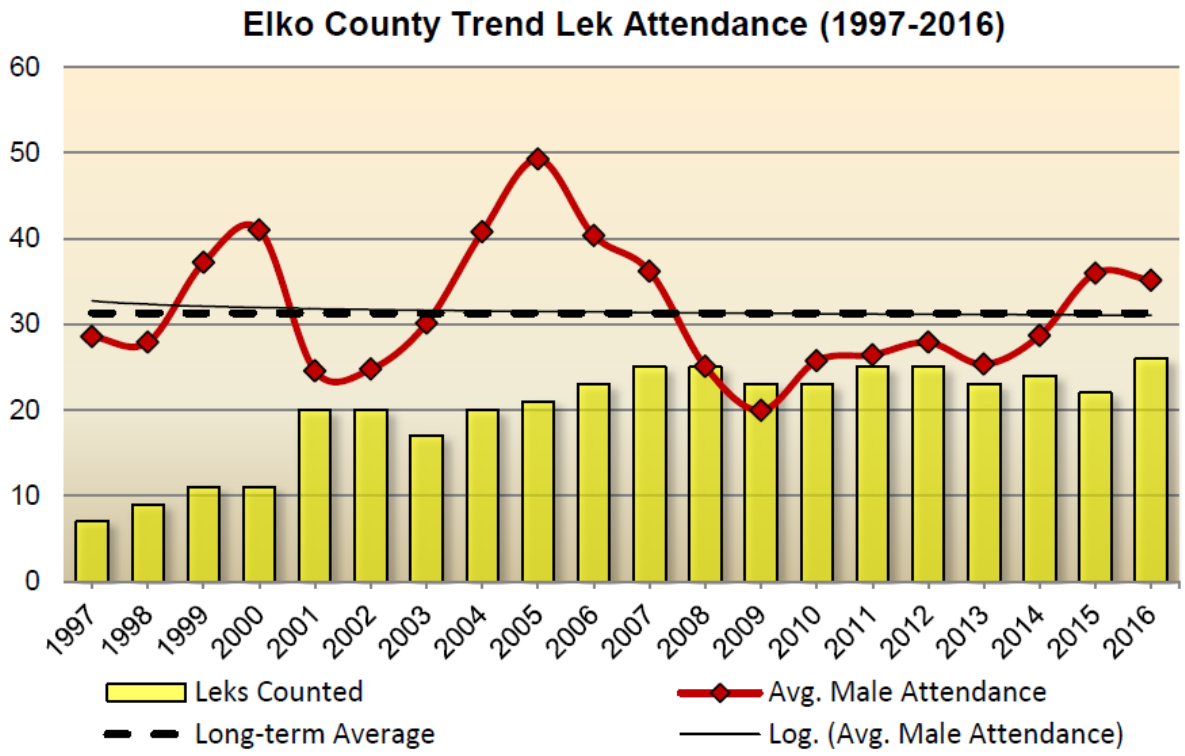


Figure 7. Trend lek attendance in the Elko Planning Area during 1997 – 2016 (NDOW 2016a).

4.4.1 Location

4.4.1.1 Central Elko BSU

The Central Elko BSU encompasses approximately 3,590,807 acres in Elko and Eureka Counties and is located within MLRA 28B (Central Nevada Basin and Range) and MLRA 25 (Owyhee High Plateau). The Central Elko BSU occurs within WAFWA MZs III and IV and includes the Snake, O'Niel Basin, Islands and North Fork PMUs. Management of public lands is administered by the Elko BLM District and the Humboldt Toiyabe National Forest. Interstate 80 forms the southern boundary of the BSU. The cities of Carlin, Elko and Wells are on the I80 corridor that forms the southern boundary.

4.4.1.2 East High Desert BSU

The East High Desert BSU encompasses approximately 2,863,972 acres in Elko and White Pine Counties and is located within MLRA 28B (Central Nevada Basin and Range) and MLRA 28A (Great Salt Lake Area). The East High Desert BSU is within WAFWA MZs III and IV and includes the East Valley and Schell/Antelope PMUs. Management of public lands is administered by the Elko and Ely BLM Districts and the Humboldt Toiyabe National Forest. Interstate 80 intersects the BSU in the northern third. The cities of McGill and West Wendover are located within the BSU.

4.4.1.3 Northeast Elko BSU

The Northeast Elko BSU encompasses approximately 955,662 acres and is located in Elko County. It is within MLRA 25 (Owyhee High Plateau) and MLRA 28A (Great Salt Lake Area). The Northeast Elko BSU is within WAFWA MZ IV, and includes the Gollaher PMU. Management of public lands is administered by the Elko BLM District and the Humboldt Toiyabe National Forest. US Route 93 forms a portion of the northwest boundary.

4.4.1.4 Ruby BSU

The Ruby BSU encompasses approximately 2,810,460 acres in Elko and White Pine Counties and is within MLRA 28B (Central Nevada Basin and Range) and MLRA 25 (Owyhee High Plateau). The Ruby BSU is within WAFWA MZ III and includes the South Fork and Ruby Valley PMUs. Management of public lands is administered by the Ely and Elko BLM Districts and the Humboldt Toiyabe National Forest. The cities of Elko, Spring Creek and Lamoille are within the BSU boundary.

4.4.2 Threat Assessment

4.4.2.1 Elko Planning Area

Threats to the Elko Planning Area by PMU are listed in Table 4. Wildfire and cheatgrass invasion are the most significant threats to GRSG populations in this region.

Current and potential impacts from mineral extraction and energy development is more prevalent in the Central Elko and Ruby BSUs. Recreation from hunters, ATV/UTV riders and nest depredation by ravens is present at a moderate to high level and impacts from off-road use and increased human presence can negatively affect vegetation. Improper livestock grazing is a potential threat depending on local management. Conifer encroachment is a relatively localized threat in the region.

4.4.2.1 Central and Northeast Elko BSUs

The Stewardship Alliance of Northeast Elko County identified wildfire, predation, drought and invasive species as the primary threats to the O'Neil Basin, Snake, and Gollaher PMUs within the Central Elko and Northeast BSUs. A full description of all current threats are provided in the Sagebrush Ecosystem Conservation Plan that was produced in 2014 to further refine threats specific to this region (SANE 2014). The islands PMU is the only PMU that was not included in their analysis, but threats are similar with possibly lower disturbance from predation, mining, and infrastructure compared to the rest of the BSU. Wildfire is considered the greatest threat to GRSG habitat within this the Central Elko BSU; lower elevations are the most susceptible to cheatgrass invasion and loss of sagebrush habitat. Recovery post-fire has occurred in some areas with sagebrush re-establishment naturally or from seeding treatments, but in other regions lek abandonment has been observed (SANE 2014). Predation was determined to be the second most significant threat to the region. Raven populations have increased XX across the Western United States (Sauer et al. 2011); anthropogenic subsidies and infrastructure provides food, perching and nesting substrates that ravens capitalize on, inflating their populations to unnaturally high levels (Boarman 2003, Webb et al. 2004), and). Using video monitoring, research in the northern part of the Gollaher PMU has identified common ravens as the primary nest predator of GRSG (Coates et al. 2008, Coates and Delehanty 2010). Mining and associated powerlines and infrastructure are prevalent within the BSU and likely contributing to increased raven numbers in the region. The SANE identified drought, and the high variability of precipitation within the plan area to significantly affect GRSG habitat. Nest success is correlated with spring precipitation to provide adequate grass cover for concealment (), and multiple years of below average rainfall can result in poor nesting success (). Due to higher resistance and resilience of the northeastern region of Nevada, cheatgrass establishment and monocultures are not as prevalent as in other parts of the state; however, it is still considered a major threat, particularly below 6,500 feet in elevation.

Increased recreation from hunting, fishing, camping, ATV/UTV riding, horseback riding and other activities can all contribute to trampling of vegetation, habitat fragmentation, and general disturbance from human presence that can alter GRSG normal behavior, movement patterns, and nest or brood-rearing success. Conifer encroachment is localized to the Salmon River and Gamble Allotments in the Gollaher PMU and is not considered a significant threat. Mining and mineral exploration is present in the region, and disturbance from increased traffic, infrastructure, and noise can result in habitat fragmentation, changes in predator communities, and changes in movement patterns of GRSG populations.

4.4.2.1 East High Desert BSU

Populations in the East Valley PMU contains small, isolated populations. Mountain ranges may also inhibit movement and dispersal of individuals. Much of this region is drier than Northeastern Nevada, resulting in potentially more significant impacts from drought conditions. Conifer encroachment is more prevalent within this BSU than other regions in the Elko Planning Area. Overutilization by wild horses, recreation by off-road vehicles are also considered significant threats in the Schell/Antelope PMU. Wildfire and annual grass cover are considered significant threats but are not as frequent as the rest of the Planning Area.

4.4.2.1 Ruby BSU

The South Fork PMU has experienced significant habitat loss and fragmentation due to wildfire, and cheatgrass and noxious weed invasion is a primary concern. Many previous crested wheatgrass seedings resulted in sagebrush loss and reduction of quality habitat; increased urbanization, recreation, and improper grazing has resulted in degraded riparian areas and has further fragmented habitat (NNSG 2004). Many portions of the South Fork PMU are in close proximity to urban and rural communities. Due to wildfire disturbed areas, fragmentation and infrastructure in the region, raven populations have likely increased in response to anthropogenic subsidies and structures. PJ encroachment is present but localized.

The eastern portion of the Ruby PMU has experienced a lower frequency of wildfire and subsequent cheatgrass invasion compared to other BSUs in the Elko Planning Area. Conifer encroachment is more prevalent in this region. Habitat quality is lower and more fragmented compared to other PMUs.

Table 4. Summary of threats to Greater Sage-grouse within the Elko Planning Area by PMU. Threat assessment information acquired from the SANE Sagebrush Ecosystem Conservation Plan[1] (SANE 2014), the Elko County Sagebrush Ecosystem Conservation Strategy[2] (NNSG 2004), the COT Final Report[3] (USFWS 2013), the North Fork PMU Assessment[4] (Back 2011), and the Greater Sage-grouse Conservation Plan for Nevada and California[5] (Sage-grouse Conservation Team 2004). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	**Threat Level by PMU**								
	Islands	**North Fork**	**O'Neil Basin**[1]	**Snake**[1]	**Gollaher**[1]	**South Fork**	**Ruby Valley**	**East Valley**	**Schell/ Antelope**[5]
Isolated/Small Size	N[3]	N[3]	N	N	N	N[3]	N[3]	Y[2]	
Sagebrush Elimination	L[3]	L[3]	L	L	L	Y[2]	L[3]	L[3]	
Agricultural	L[3]	L[3]	N	N	N	Y[2]	L[2]	L[3]	

Conversion									
Fire	Y[3]	Y[2,4]	Y	Y	Y	Y[2]	L[2]	L[2]	Y
Conifers	N	L	L	L	L	L[2]	Y[2]	Y[3]	Y
Weeds/Annual	Y[3]	Y[2,4]	Y	Y	Y	Y[2]	L[2]	Y[3]	Y
Grasses									
Energy	L[3]	L[3]	N	N	N	L[3]	L[3]	L[3]	L
Mining	L[3]	Y[2,4]	L	L	L	L[2]	L[3]	L[3]	N
Infrastructure	L[2]	Y[2,4]	Y	Y	Y	Y[2]	L[2]	L[2]	L
Grazing	L[2]	Y[2,4]	L	L	L	Y[2]	L[2]	L[2]	L
Free-Roaming Equids	N[3]	N[3]	N	N	N	N[3]	N[3]	N[3]	Y
Recreation	Y[3]	Y[2,4]	Y	Y	Y	Y[2]	L[2]	L[3]	L
Urbanization	L[3]	Y[2]	L	L	L	Y[2]	L[2]	L[2]	
Predation	N[2]	Y[2,4]	Y	Y	Y	Y[2]	L[2]	L[2]	Y
Drought	L[2]	L[2]	Y	Y	Y	L[2]	L[2]	Y[2]	Y

4.4.2.2 Proposed and completed conservation actions for sage-grouse

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Stewardship Alliance of Northeast Elko County Sagebrush Ecosystem Conservation Plan

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Conservation/SANE-Sagebrush-Ecosystem-Conservation-Plan.pdf

- Elko County Sagebrush Ecosystem Conservation Strategy

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/NNSG-PLAN.pdf

- North Fork Population Management Unit Assessment

  http://nnsg.org/Projects/North%20Fork/North%20Fork%20PMU%20Assessment.RPT.Final.pdf

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf;
  http://www.ndow.org/Nevada_Wildlife/Sage_Grouse/Conservation_Plans/

- Nevada Sage-Grouse Conservation Project

http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.4.3 Key Conservation Strategies for the Elko Planning Area

4.4.3.1 General Management Guidelines

- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.
- Develop a public outreach and educational component for both anticipated and completed projects.

4.4.3.2 Priority Conservation Strategies

Elko Planning Area

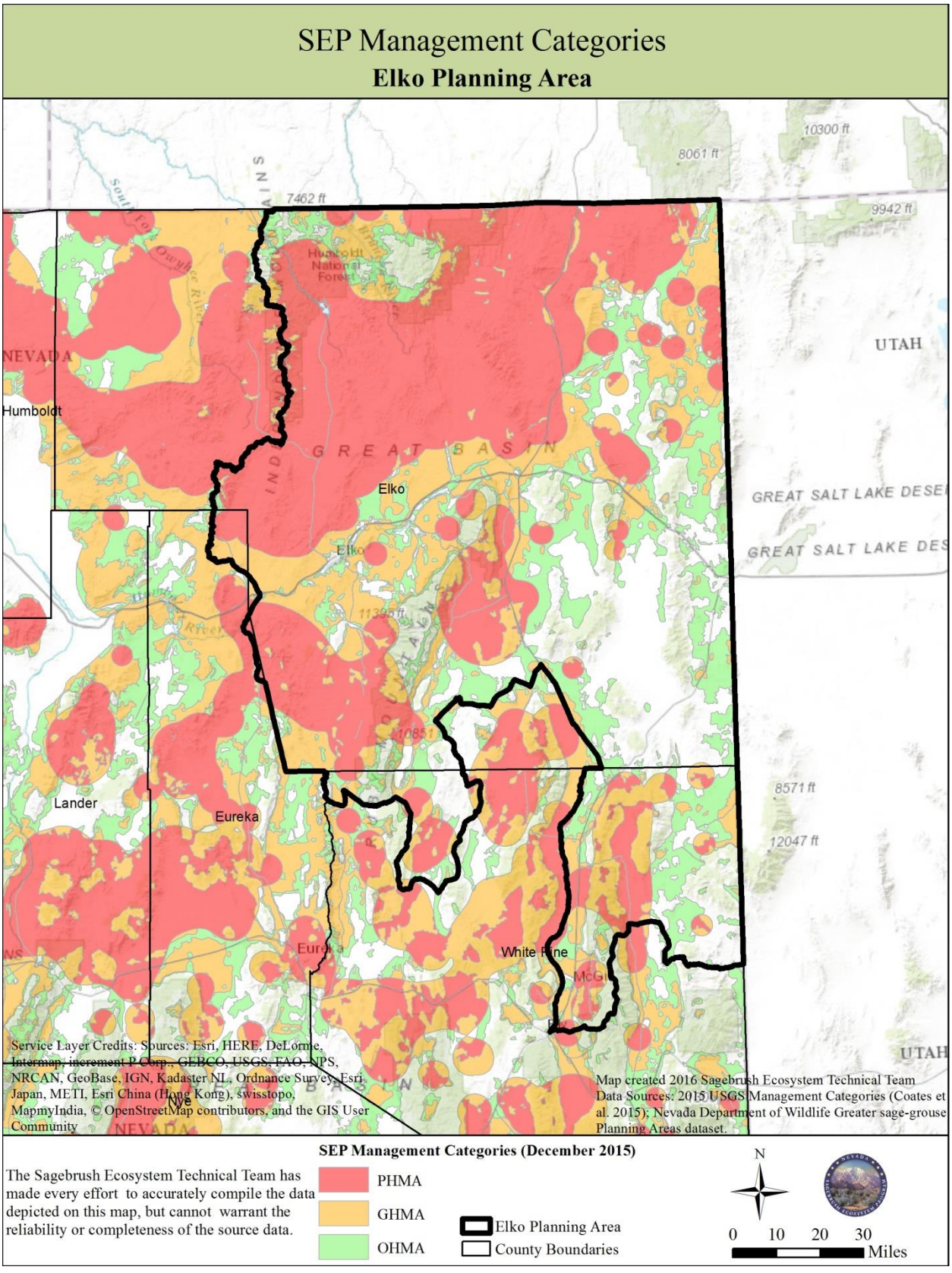
- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Focus efforts to stop advancement of invasive and noxious annual grasses
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Manage livestock grazing in a sustainable, adaptive approach to promote successful re-establishment of planted vegetation following wildfire.
- Manage livestock grazing in a sustainable, adaptive approach to maintain or enhance habitat conditions within the SGMAs.
- Conduct PFC of meadows and riparian habitats within SGMAs and develop a monitoring program to identify areas that are Non-functioning or Functioning at risk, and prioritize those systems for conservation projects or development of new management plans.

- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.

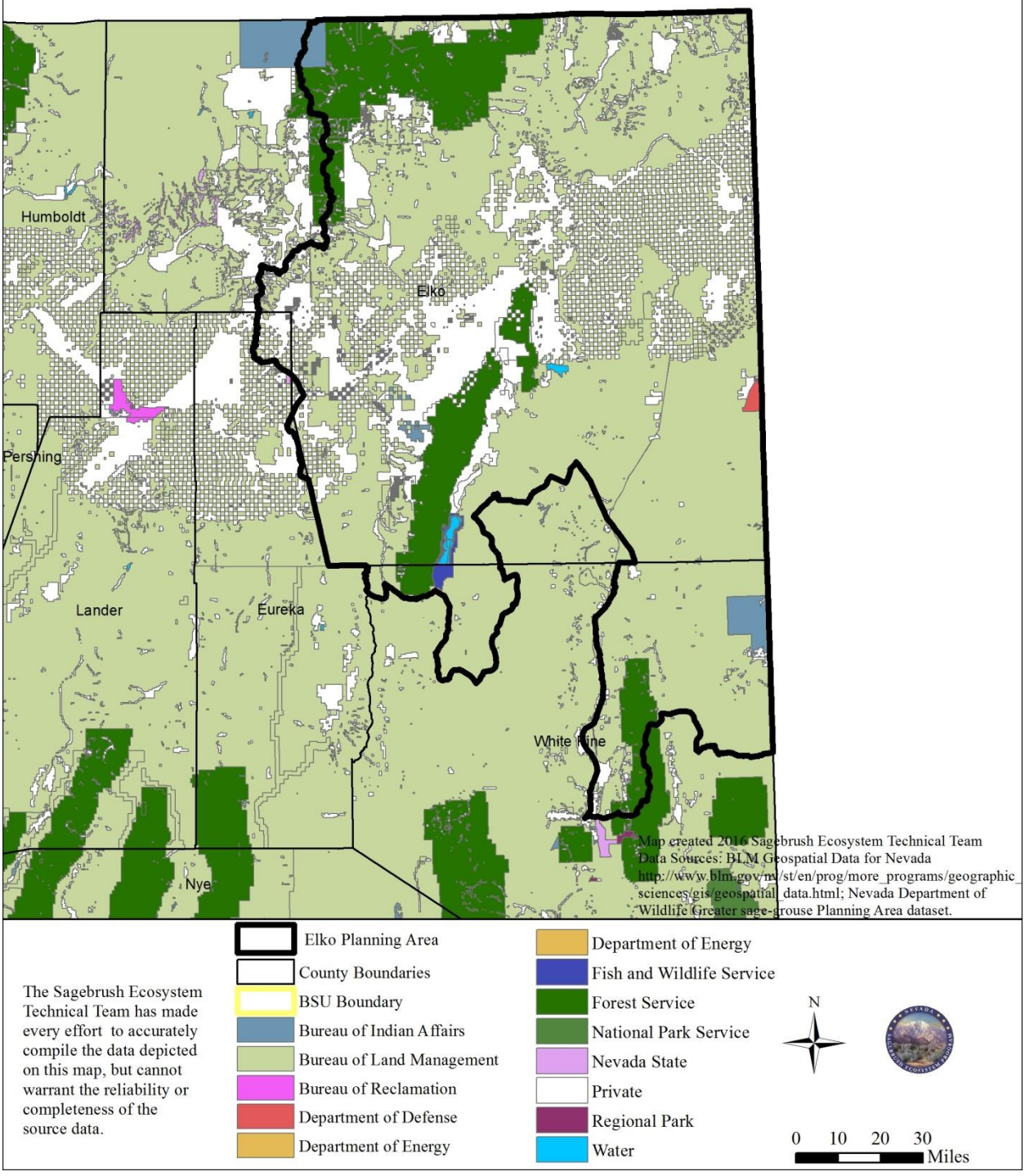
4.4.3.3 Secondary Conservation Strategies

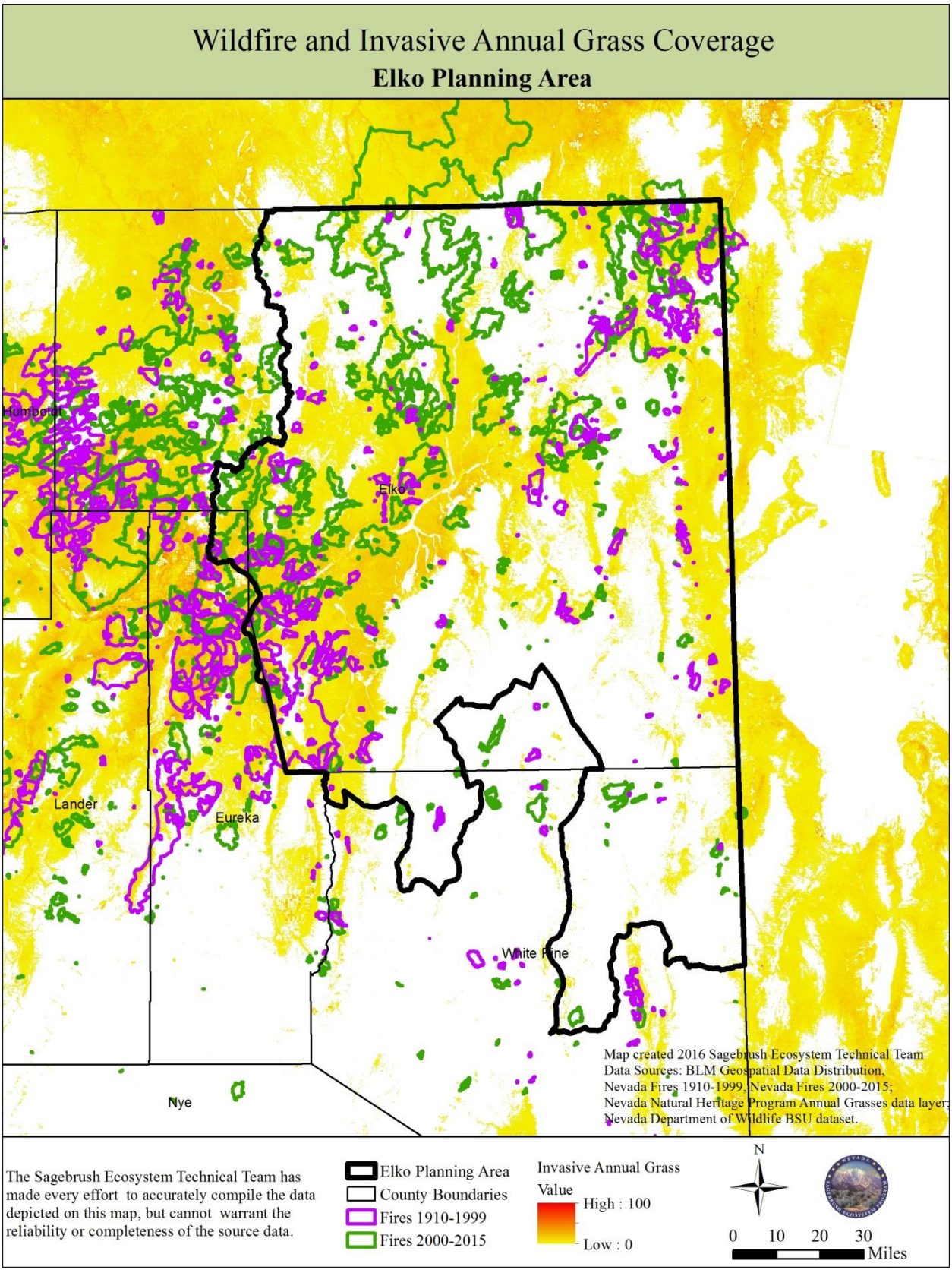
Elko Planning Area

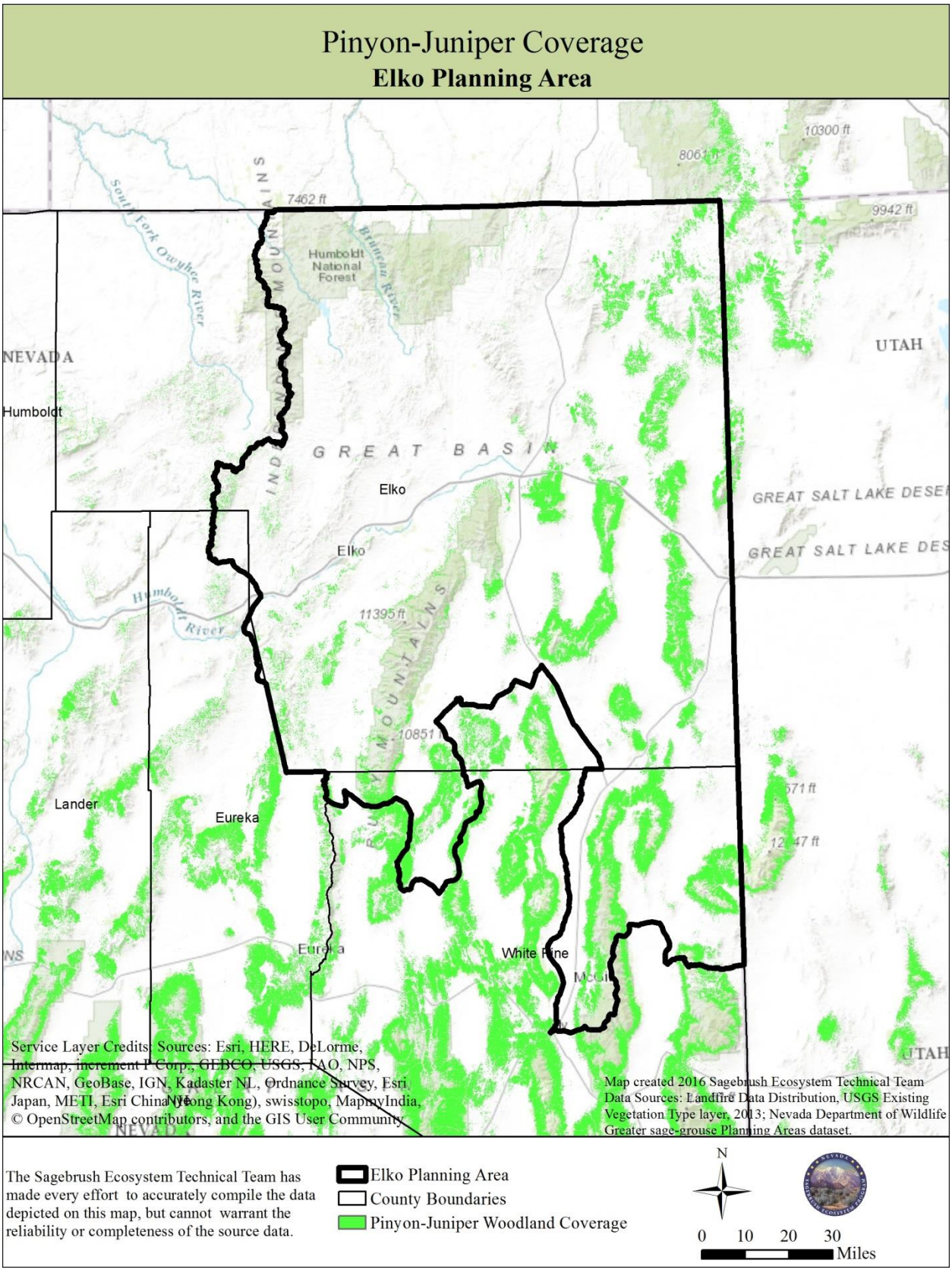
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).
- Encourage and support management of wild horse and burro populations at AML.

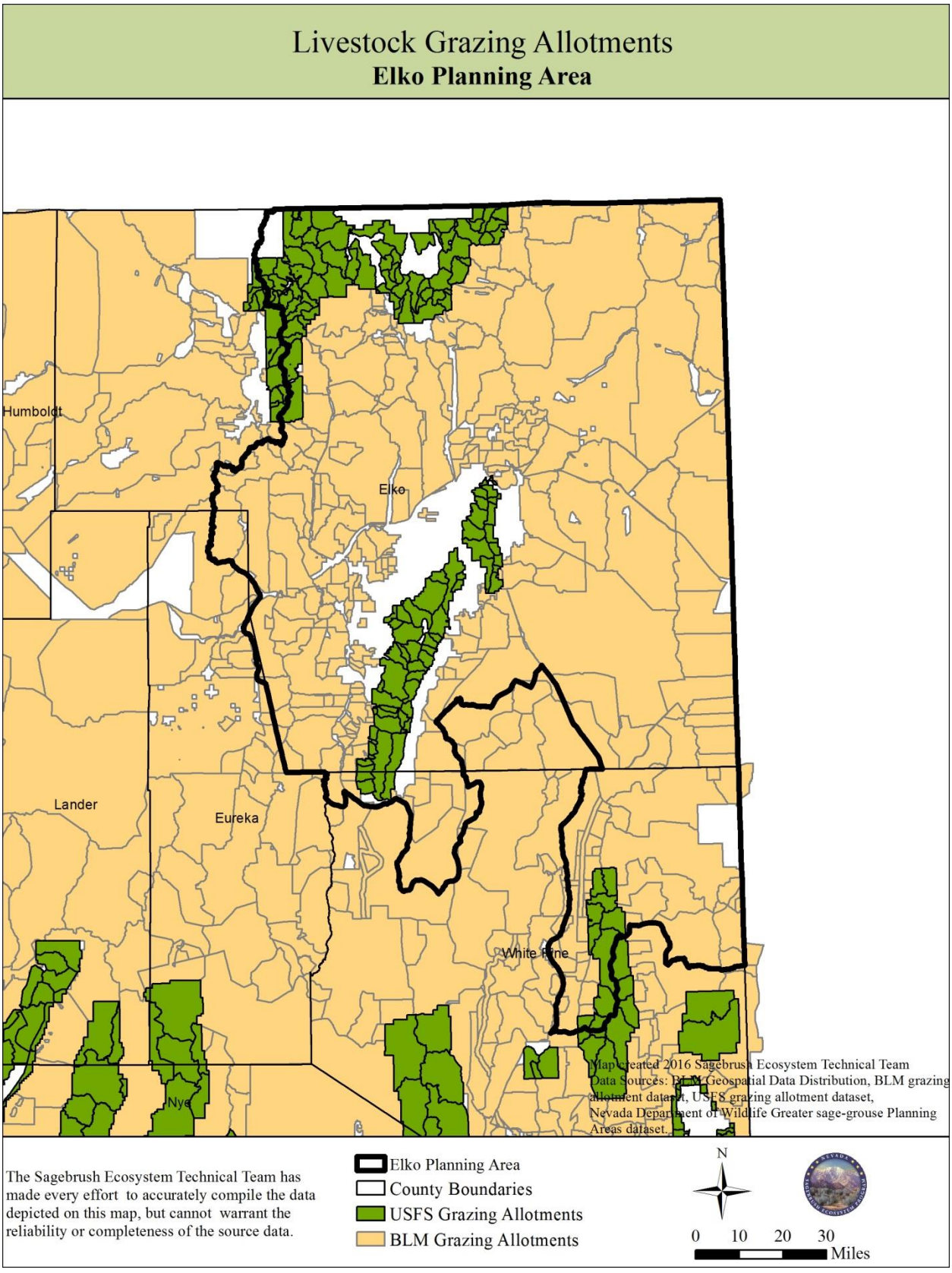

SEP Management Categories
Elko Planning Area
10300 ft
8061 ft
7462 ft
9942 ft
Humboldt National Forest
NEVADA
UTAH
Humboldt
GREAT BASIN
Elko
GREAT SALT LAKE DESE
GREAT SALT LAKE DES
11395 ft
10851
8571 ft
12047 ft
Lander
Eureka
White Pine
McG
Nye
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
Elko Planning Area
County Boundaries
N
0 10 20 30
Miles

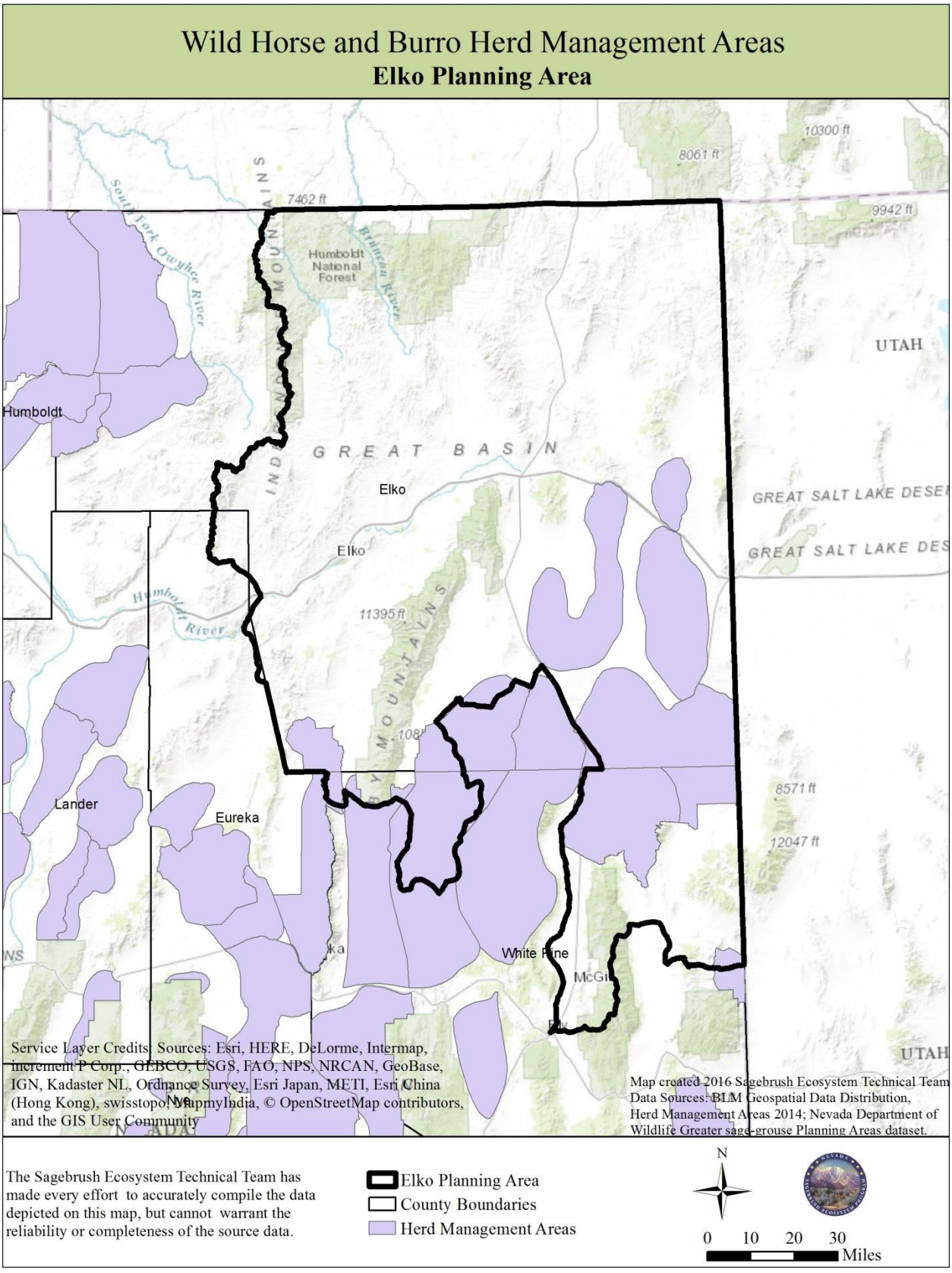
Land Ownership
Elko Planning Area

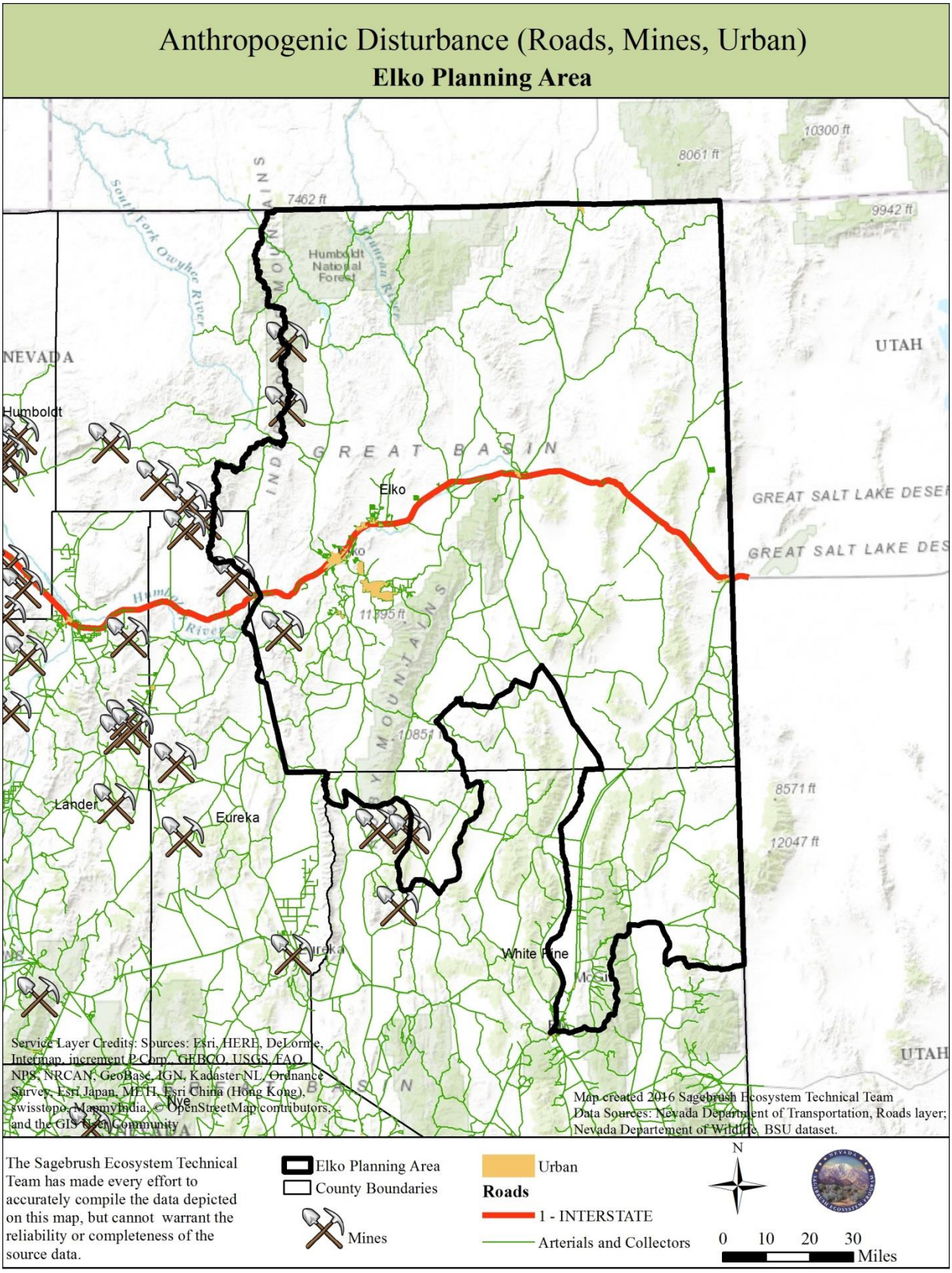



Wildfire and Invasive Annual Grass Coverage
Elko Planning Area
Elko
Lander
Eureka
White Pine
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Elko Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Elko Planning Area
10300 ft
8061 ft
7462 ft
9942 ft
Humboldt National Forest
South Fork Owyhee River
Bruneau River
NEVADA
UTAH
Humboldt
GREAT BASIN
Elko
GREAT SALT LAKE DESE
GREAT SALT LAKE DES
Humboldt River
11395 ft
10851 ft
Lander
Eureka
White Pine
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Elko Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Livestock Grazing Allotments
Elko Planning Area
Humboldt
Elko
Lander
Eureka
White Pine
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Elko Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
Elko Planning Area
10300 ft
8061 ft
9942 ft
7462 ft
Humboldt National Forest
South Fork Owyhee River
Bruneau River
UTAH
Humboldt
GREAT BASIN
Elko
GREAT SALT LAKE DESE
GREAT SALT LAKE DES
Humboldt River
11395 ft
Lander
Eureka
8571 ft
12047 ft
White Pine
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Elko Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Elko Planning Area
NEVADA
UTAH
Humboldt
Elko
Lander
Eureka
White Pine
Nye
GREAT BASIN
GREAT SALT LAKE DESE
GREAT SALT LAKE DES
Humboldt National Forest
South Fork Owyhee River
Humboldt River
7462 ft
8061 ft
10300 ft
9942 ft
11395 ft
10851 ft
8571 ft
12047 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Roads layer; Nevada Departement of Wildlife, BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Elko Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles

4.5 LINCOLN PLANNING AREA

The Lincoln Planning Area occurs within WAFWA MZ III and is comprised of two Biologically Significant Units: the Southeastern Nevada and Quinn Units. Trend lek attendance for the Planning Area is provided in Figure 8. The Southeastern Nevada BSU extends into Utah. Both BSUs are characterized by small, isolated populations with limited connectivity between other populations in Nevada or Utah. Primary threats include wildfire, P-J encroachment, increased recreation, nest depredation by ravens, habitat fragmentation, and over utilization by feral horses.

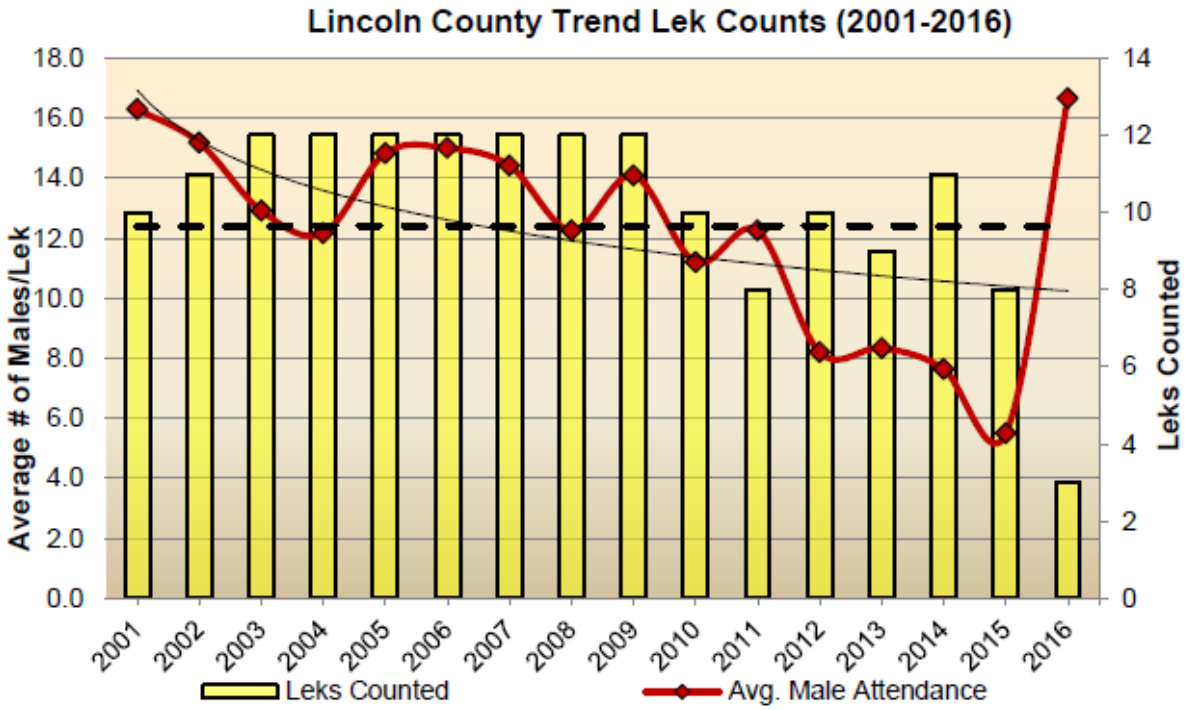


Figure 8. Trend lek attendance in the Lincoln Planning Area during 2001 – 2016 (NDOW 2016a).

4.5.1 Location

4.5.1.1 Southeastern Nevada BSU

The Southeastern Nevada BSU encompasses approximately 3,413,331 acres in Nye and Lincoln Counties. It is within MLRA 28B (Central Nevada Basin and Range) and MLRA 29 (Southern Nevada Basin and Range). The BSU includes the Spring/Snake Valley, Lincoln, and Steptoe Cave PMUs. Management of public lands is administered by the Ely and Battle Mountain BLM Districts and the Humboldt Toiyabe National Forest.

4.5.1.2 Quinn BSU

The Quinn BSU encompasses approximately 2,006,243 acres in located in White Pine and Lincoln Counties and includes the Quinn PMU. It is within MLRA 28B (Central Nevada Basin and Range) and MLRA 28A (Great Salt Lake Area). Management of public lands is administered by the Ely BLM District and the Humboldt Toiyabe National Forest. The city of Ely is along the northwest boundary and the Nevada/Utah state line forms the eastern boundary.

4.5.2 Threat Assessment

4.5.2.1 Lincoln Planning Area

Threats to the Lincoln Planning Area are listed in Table 4. Primary threats to the Southeastern Nevada BSU include P-J encroachment, wildfire, cheatgrass invasion, and overutilization by feral horses. This BSU is considered relatively stable, but if populations decline connectivity between both Nevada and Utah populations can be further compromised.

The Lincoln Conservation Plan Addendum contains updated risk assessments from the 2004 State Conservation Plan for the Cave Valley and Lincoln PMUs. They identified all phases of PJ encroachment as significant threats to GRSG habitat. PJ has expanded and displaced GRSG from areas that were historically heavily used, including important brood-rearing areas that are now mature conifer stands. Several large fires (e.g., Mountain, Mt. Wilson, and Coyote Fires) that removed PJ are now being used by GRSG. Nest predation by ravens is considered high in the region. Little data exists documenting nest predation, but corvid observations have increased. Feral horses are also considerably above AML. Current and potential impacts from renewable energy development (i.e., wind), powerlines, Southern Nevada Water Authority water transfer pipeline, and associated infrastructure is considered high.

The Spring/Snake Valley PMU has experienced significant PJ encroachment and is considered one of the primary threats to this area. Hunting and poaching are also concerns within this PMU primarily due to

smaller, isolated populations. This PMU does not have feral horses, and improper grazing is not considered a major threat.

The Quinn BSU contains a very small population, which makes the population more susceptible to extirpation from extreme conditions or major disturbances such as wildfire. P-J encroachment is a significant threat to this population, and in addition to a substantial salt desert shrub component in the region, little contiguous sagebrush cover exists. However, little is known about this population and more research is needed to assess threats to this PMU.

Table 5. Summary of threats to Greater Sage-grouse within the Southeastern Nevada and Quinn BSUs. Threat assessment information acquired from the Lincoln County Sage-grouse Conservation Plan Addendum[1] (2014), Greater Sage-grouse Conservation Plan for Nevada and California[2] (Sage-grouse Conservation Team 2004) and the COT Final Report[3] (USFWS 2013). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	**Cave Valley/ Lincoln**	**Spring/Snake Valley[3] (get from COT)**	**Quinn**
Isolated/Small Size	Y[1,3]	Y[2]	Y[2,3]
Sagebrush Elimination	N[3]	N[3]	N[3]
Agricultural Conversion	N[3]	N[3]	N[3]
Fire	Y[1,3]	Y[2,3]	Y[2,3]
Conifers	Y[1,3]	Y[2]	Y[2,3]
Weeds/Annual Grasses	Y[1,3]	L[2]	Y[2,3]
Energy	Y[1]	N[3]	N[3]
Mining	L[1,3]	N[2,3]	N[3]
Infrastructure	Y[1,3]	Y[3]	L[2]
Grazing	Y[1,3]	L[2]	Y[2,3]
Free-Roaming Equids	Y[1,3]	N[2]	Y[2,3]
Recreation	Y[1,3]	L[2]	L[2]
Urbanization	N[1,3]	N[3]	N[2,3]
Predation	Y[1]	Y[2]	Y[2]

4.5.2.2 Proposed and completed conservation actions for sage-grouse

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf

- Lincoln County Sage Grouse Conservation Plan

http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/Lincoln-County-Plan.pdf

- Nevada Sage-Grouse Conservation Project

  http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.5.3 Key Conservation Strategies for the Lincoln Planning Area

4.5.3.1 General Management Guidelines

- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.
- Develop a public outreach and educational component for both anticipated and completed projects.

4.5.3.2 Priority Conservation Strategies

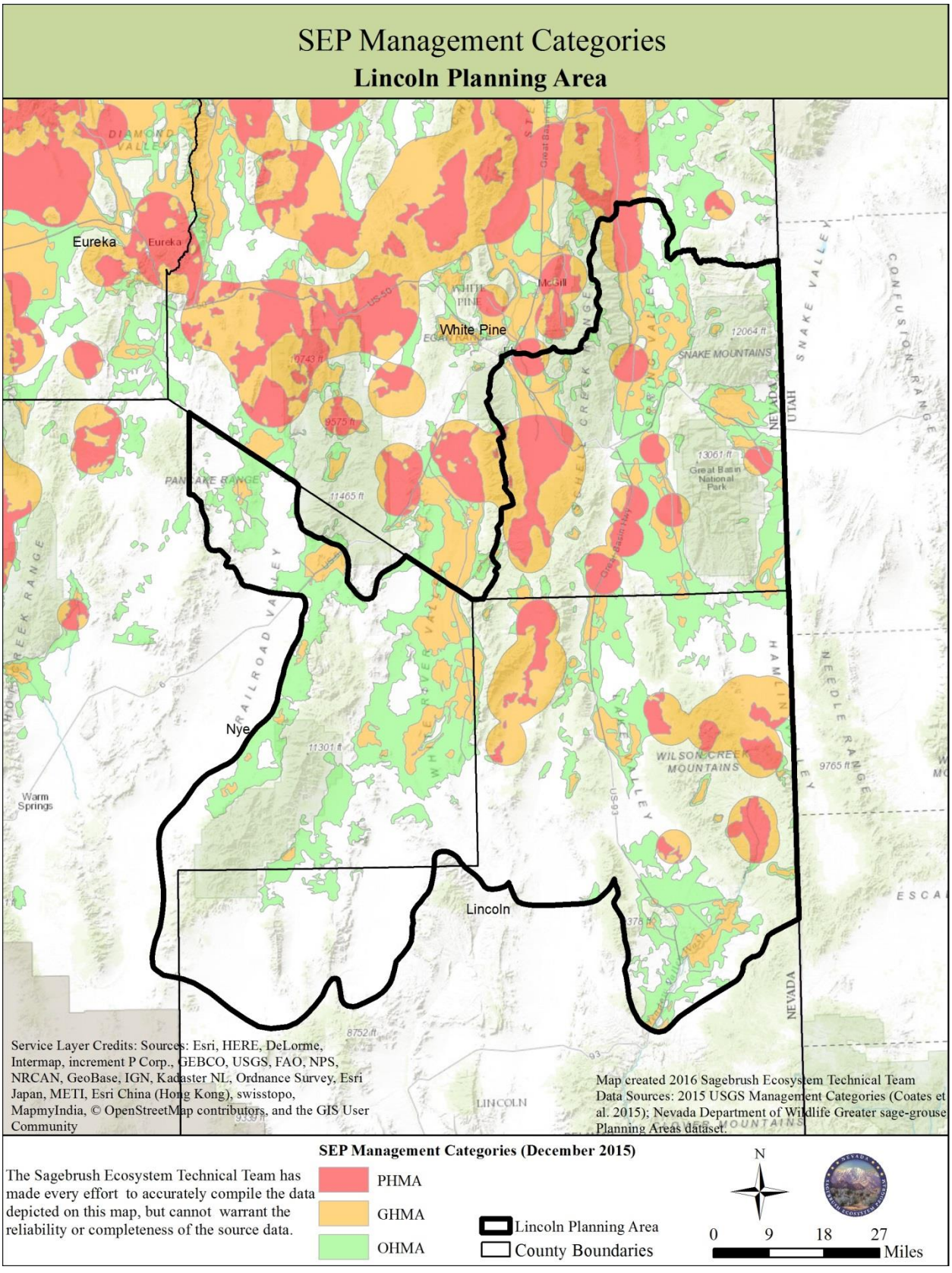
Lincoln Planning Area

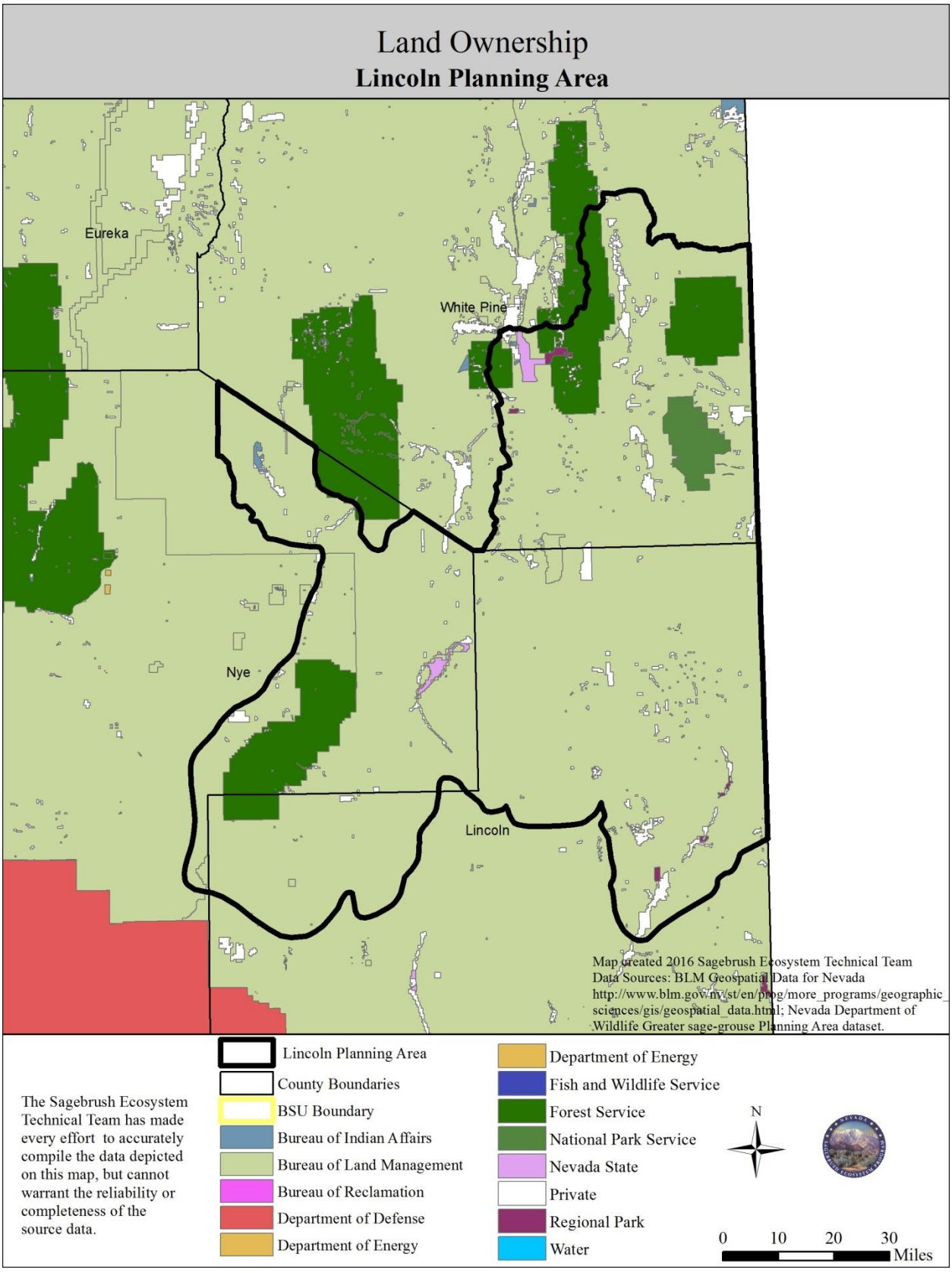
- Identify areas for Phase I and II P-J removal in SGMAs to increase the availability of sagebrush cover.
- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Focus efforts to stop advancement of invasive and noxious annual grasses
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Encourage and support management of wild horse and burro populations at AML.

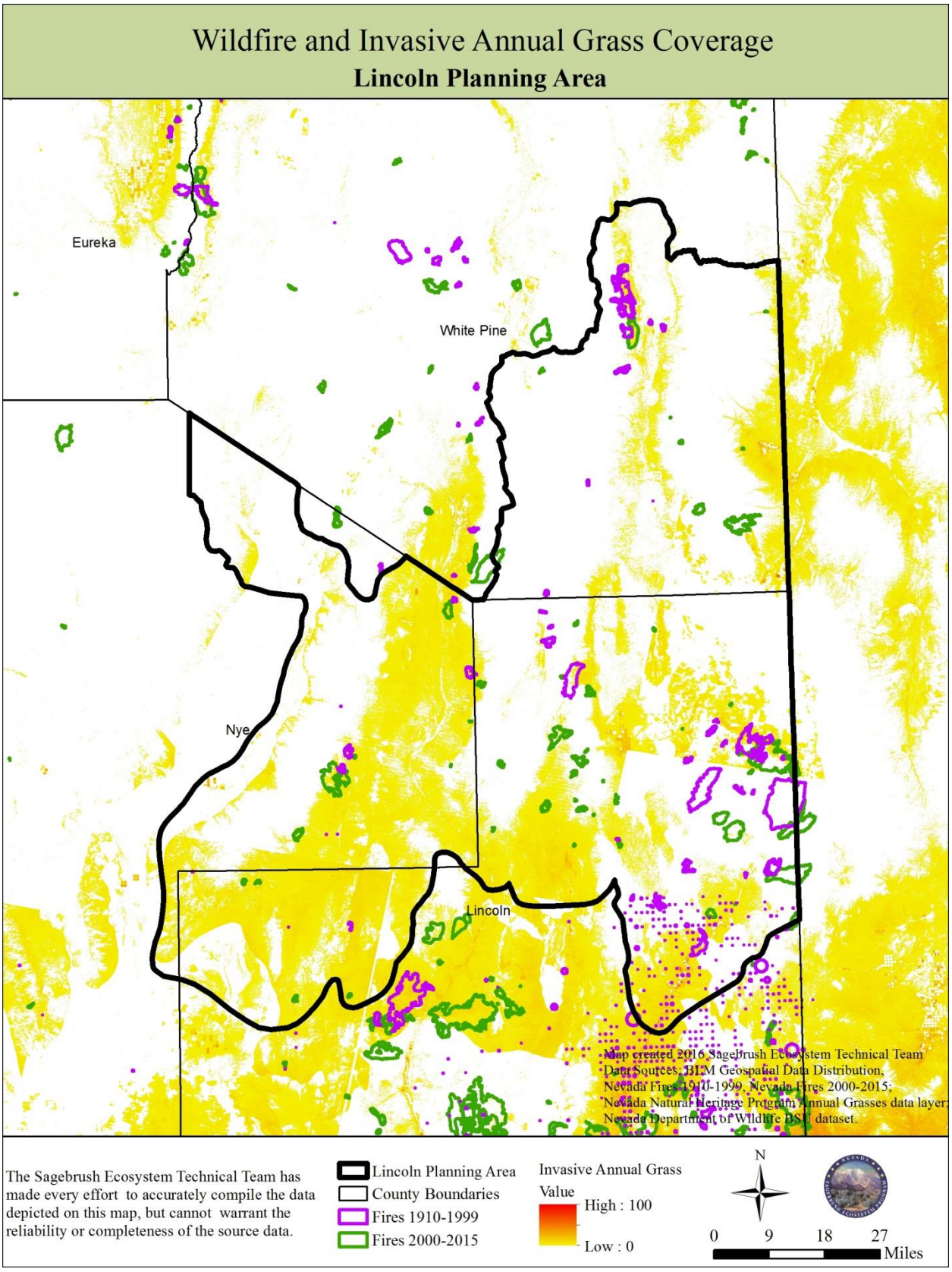
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.

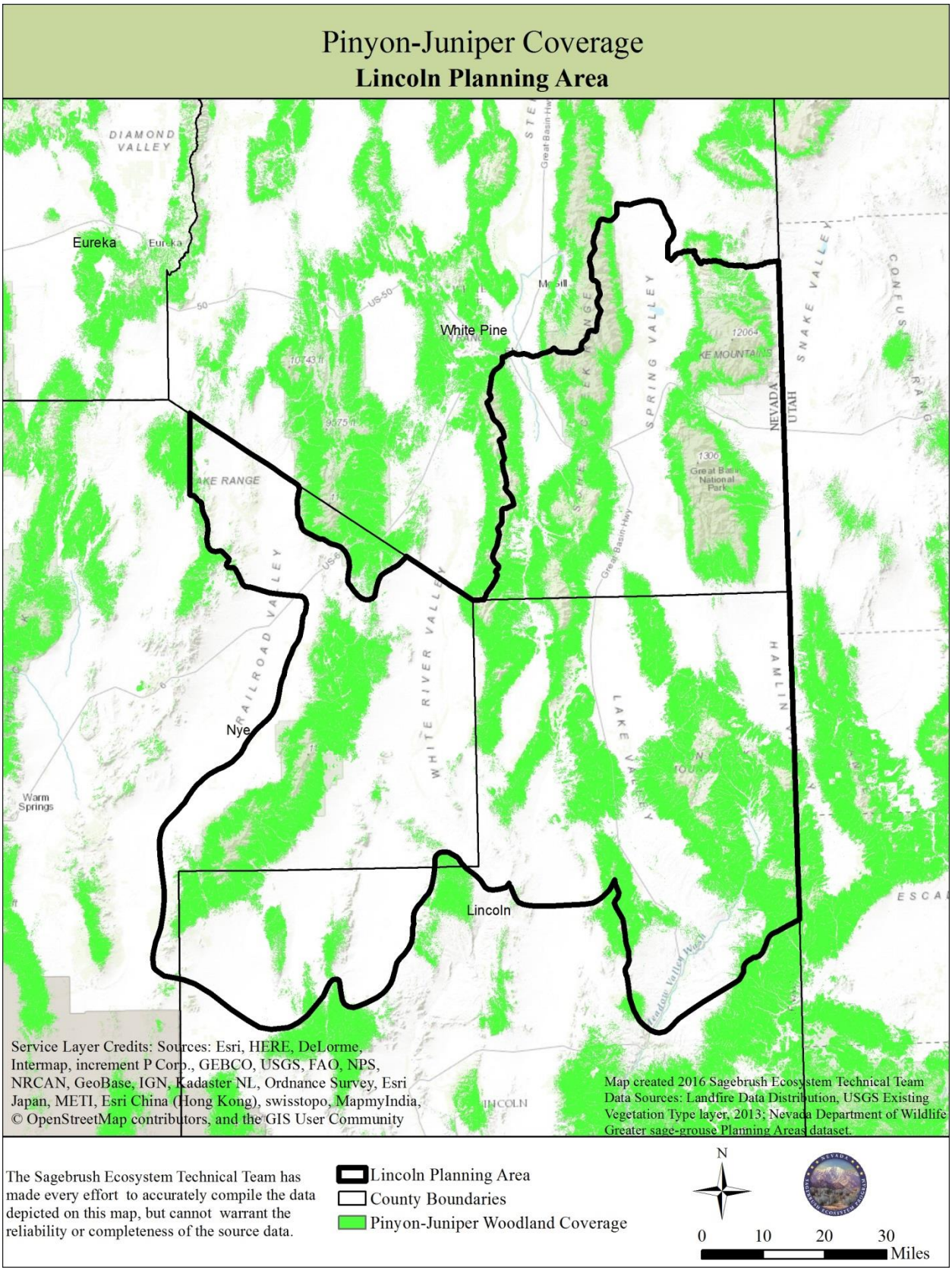
Quinn BSU

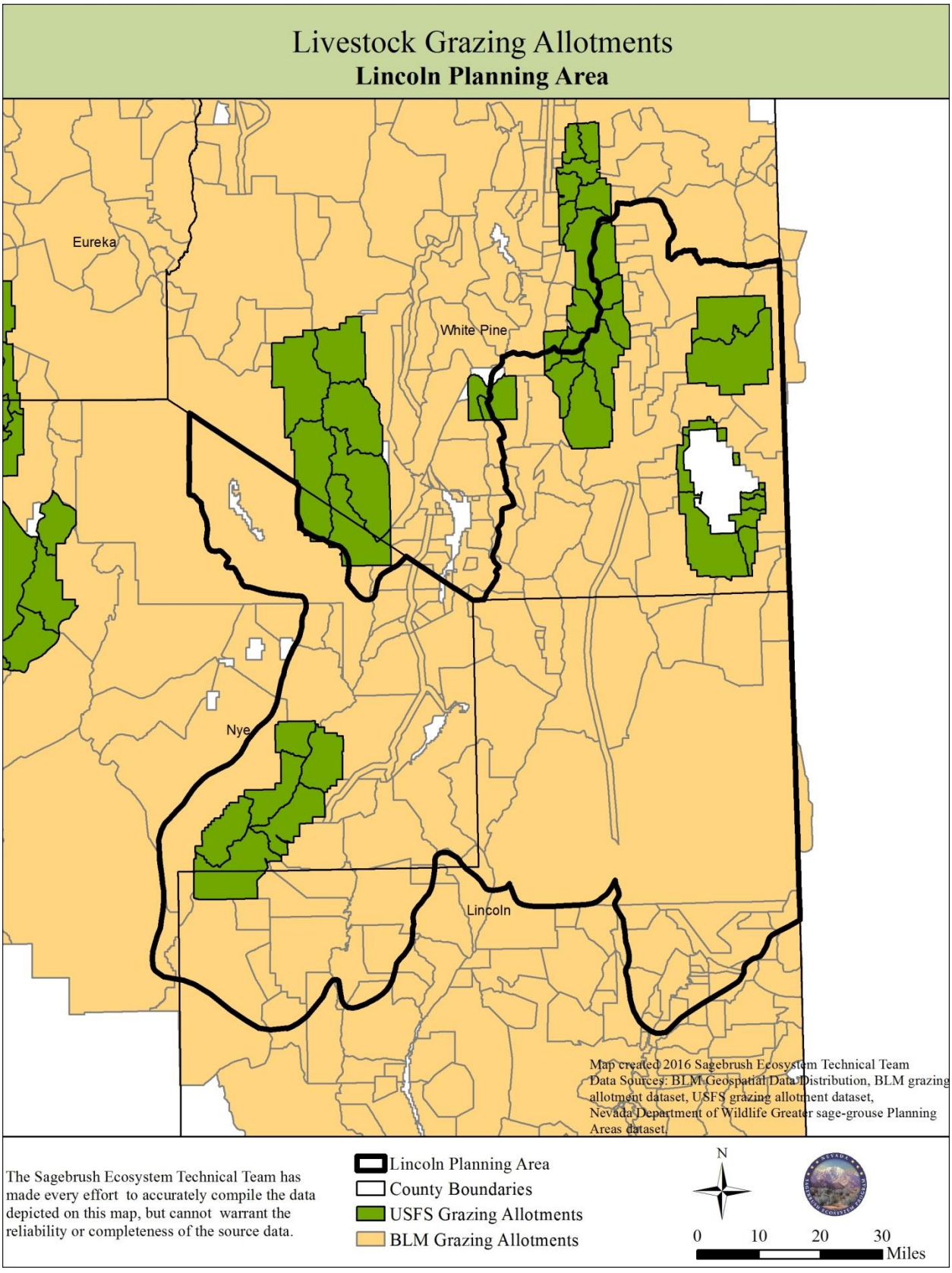
- Manage livestock grazing in a sustainable, adaptive approach to promote successful re-establishment of planted vegetation following wildfire.
- Manage livestock grazing in a sustainable, adaptive approach to maintain or enhance habitat conditions within the SGMAs.
- Encourage and support management of wild horse and burro populations at AML.

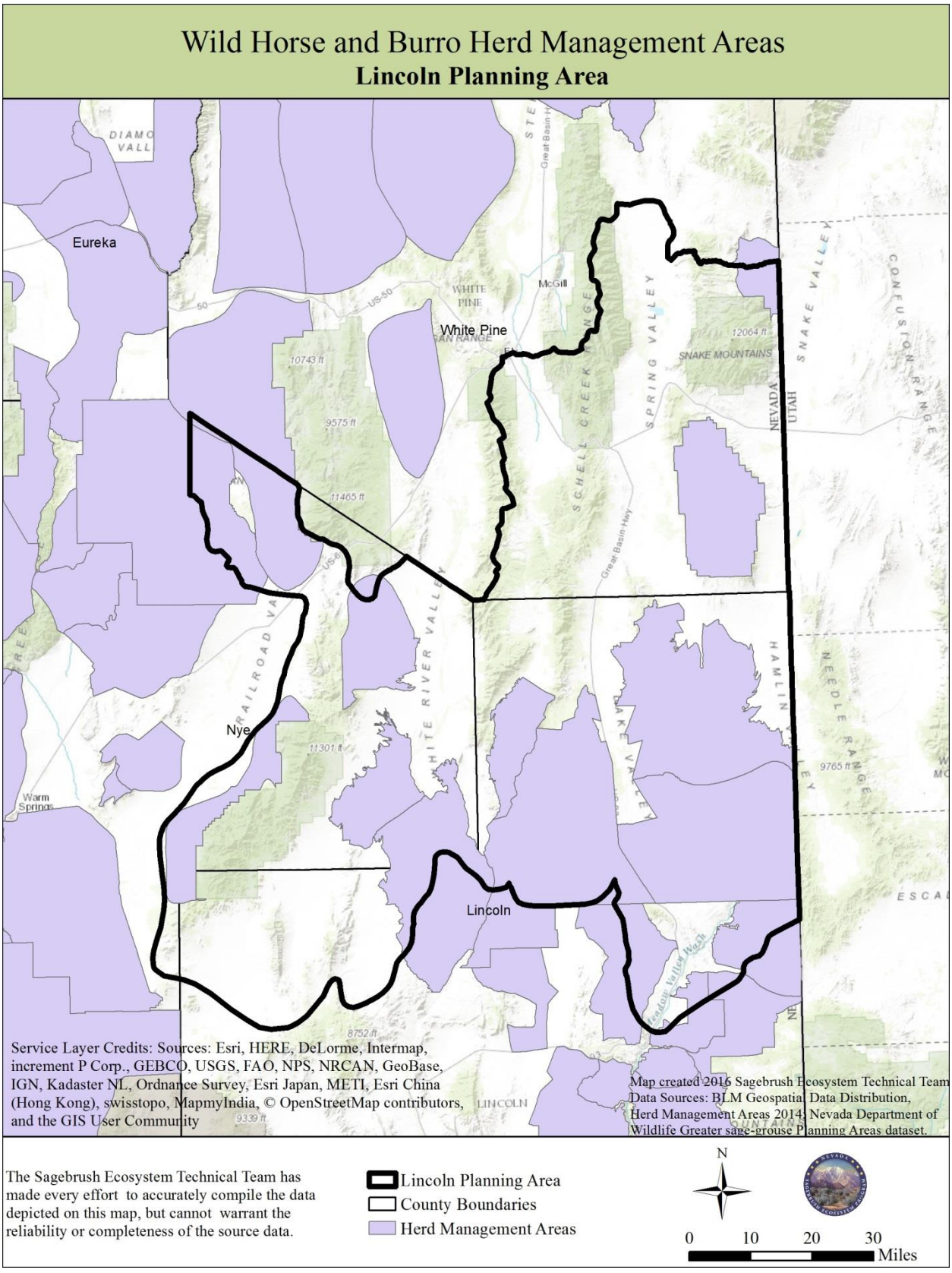

SEP Management Categories
Lincoln Planning Area
Eureka
White Pine
Nye
Lincoln
Warm Springs
DIAMOND VALLEY
SNAKE MOUNTAINS
Great Basin National Park
PANCAKE RANGE
WILSON CREEK MOUNTAINS
NEVADA
UTAH
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
Lincoln Planning Area
County Boundaries
N
0 9 18 27
Miles


Land Ownership
Lincoln Planning Area
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife Greater sage-grouse Planning Area dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Lincoln Planning Area
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles


Wildfire and Invasive Annual Grass Coverage
Lincoln Planning Area
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Lincoln Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 9 18 27
Miles

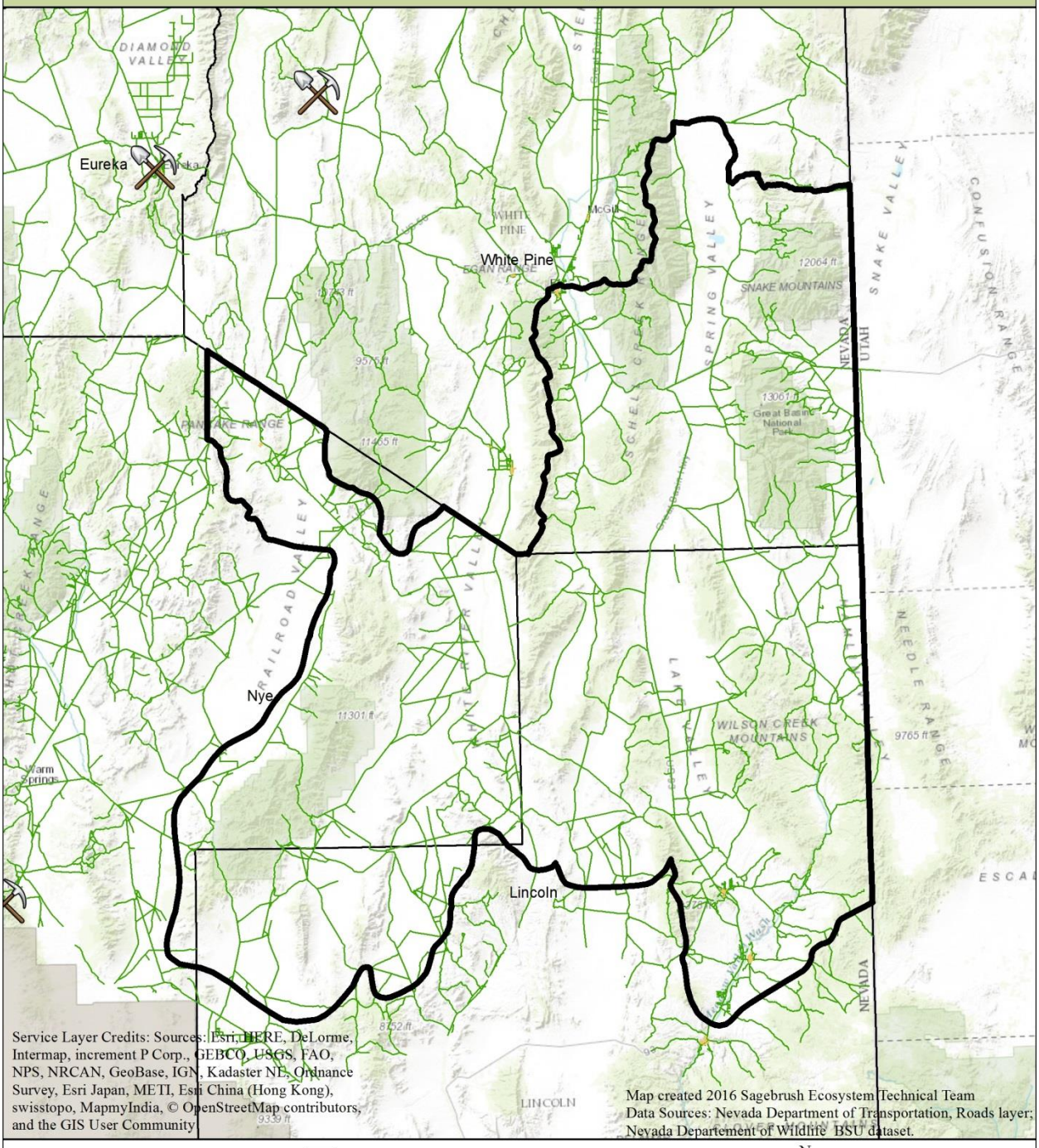

Pinyon-Juniper Coverage
Lincoln Planning Area
DIAMOND VALLEY
Eureka
White Pine
SPRING VALLEY
SNAKE VALLEY
NEVADA
UTAH
Great Basin National Park
RAILROAD VALLEY
WHITE RIVER VALLEY
HAMLIN
Nye
Warm Springs
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Lincoln Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Livestock Grazing Allotments
Lincoln Planning Area
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Lincoln Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
Lincoln Planning Area
Eureka
White Pine
Nye
Lincoln
McGill
WHITE PINE
SNAKE MOUNTAINS
SPRING VALLEY
SNAKE VALLEY
HAMLIN
Warm Springs
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
Lincoln Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles

Anthropogenic Disturbance (Roads, Mines, Urban)

Lincoln Planning Area



The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

Lincoln Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors

N

0 10 20 30
Miles

4.6 WHITE PINE PLANNING AREA

The White Pine Planning Area occurs within WAFWA MZ III and is comprised of the Butte/Buck/White Pine BSU. Trend lek attendance for the Planning Area is provided in Figure 8. Much of the White Pine Planning Area is typically drier than other parts of Nevada and is characterized by salt desert scrub communities along the valley bottoms that transitions to expanses of sagebrush covered benches. The mountain big sagebrush and shrub community at higher elevations provide important brood-rearing (and nesting) habitat for populations in this region. The primary threats identified within the White Pine Planning Area include extensive P-J encroachment, which dominates the mid-elevation ranges. Wildfire and invasive annual grasses are also significant threats. Improper livestock grazing, wild horse and burro overutilization, mineral exploration and extraction and associated infrastructure are also threats present within the region.

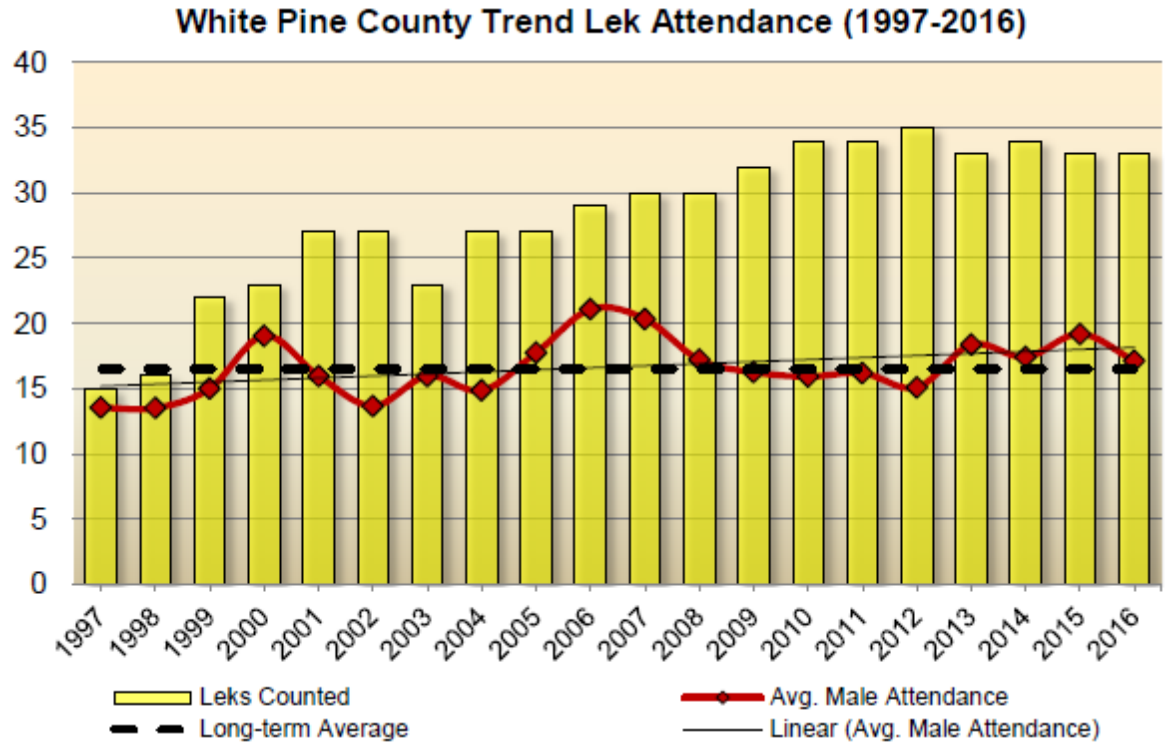


Figure 9. Trend lek attendance in the White Pine Planning Area during 1997 – 2016 (NDOW 2016a).

4.6.1 Location

4.6.1.1 Butte/Buck/White Pine BSU

The Butte/Buck/White Pine BSU encompasses approximately 2,845,364 acres in White Pine, Elko and Nye Counties and is located within MLRA 28B (Central Nevada Basin and Range). The BSU is also designated as the Butte/Buck/White Pine PMU. Management of public lands is administered by the Ely and Elko BLM Districts and the Humboldt Toiyabe National Forest. There are no major highways within the BSU. The town of Ruth is within the BSU, and the city of Ely is on the eastern boundary.

4.6.2 Threat Assessment

4.6.2.1 Butte/Buck/White Pine BSU

Threats to the White Pine Planning Area are listed in Table 6. Primary threats include P-J encroachment, which transitions sagebrush communities to conifer woodlands in much of this region. Habitat restoration and recovery becomes more difficult as the shrub, grass, and forb components are displaced by conifer expansion. As mountain big sagebrush at higher elevations becomes encroached by P-J, large areas of brood-rearing habitat can be lost. Increased conifer cover can provide perches for avian predators. GRSG will use Phase I PJ (canopy cover <10%; Miller et al. 2008), but individuals move faster through conifer stands which increases risk of mortality (Prochazka et al. 2016). Wildfire and cheatgrass invasion are also important threats, however this is less prevalent than in other Planning Areas. Other threats include impacts from recreation, mining, overgrazing by livestock and horses.

Table 6. Summary of threats to Greater Sage-grouse within the Southeastern Nevada and Quinn BSUs. Threat assessment information acquired from Greater Sage-grouse Conservation Plan for Nevada and California[1] (Sage-grouse Conservation Team 2004) and the COT Final Report[2] (USFWS 2013). Threats characterized by Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Threat	Threat Level
Isolated/Small Size	L[2]
Sagebrush Elimination	L[2]
Agricultural Conversion	L[2]
Fire	Y[1]
Conifers	Y[1]
Weeds/Annual Grasses	L[1]
Energy	L[2]
Mining	Y[2]
Infrastructure	Y[2]
Grazing	Y[2]
Free-Roaming Equids	Y[2]
Recreation	L[1]

Urbanization	N[1,2]
Predation	Y[1]

4.6.2.2 Proposed and completed conservation actions for sage-grouse

This section includes available Management and Conservation Plans developed by NDOW, LAWGs, Stewardship Groups, Technical Teams, or other working/planning groups.

- Greater Sage-Grouse Conservation Plan for Nevada and California

  http://sagemap.wr.usgs.gov/docs/rs/2004%20Nevada-Eastern%20CA%20plan.pdf

- White Pine County Portion (Lincoln/White Pine Planning Area) Sage Grouse Conservation Plan

  http://www.ndow.org/uploadedFiles/ndoworg/Content/Nevada_Wildlife/Sage_Grouse/White-Pine-Plan.pdf

- Nevada Sage-Grouse Conservation Project

  http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/WGA%20WWC%20Sage%20Grouse%20Report.pdf

4.6.3 Key Conservation Strategies for the White Pine Planning Area

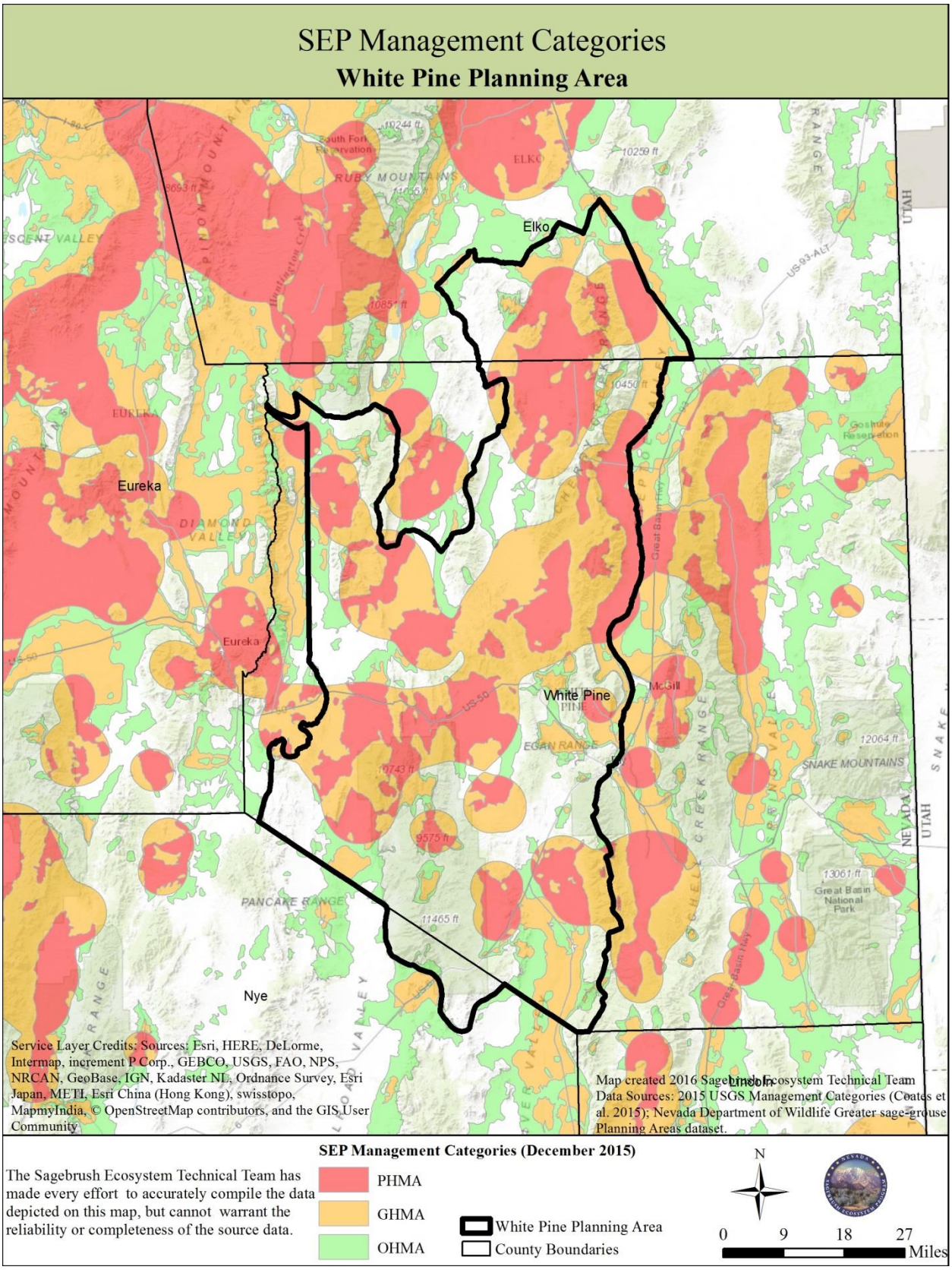
4.6.3.1 General Management Guidelines

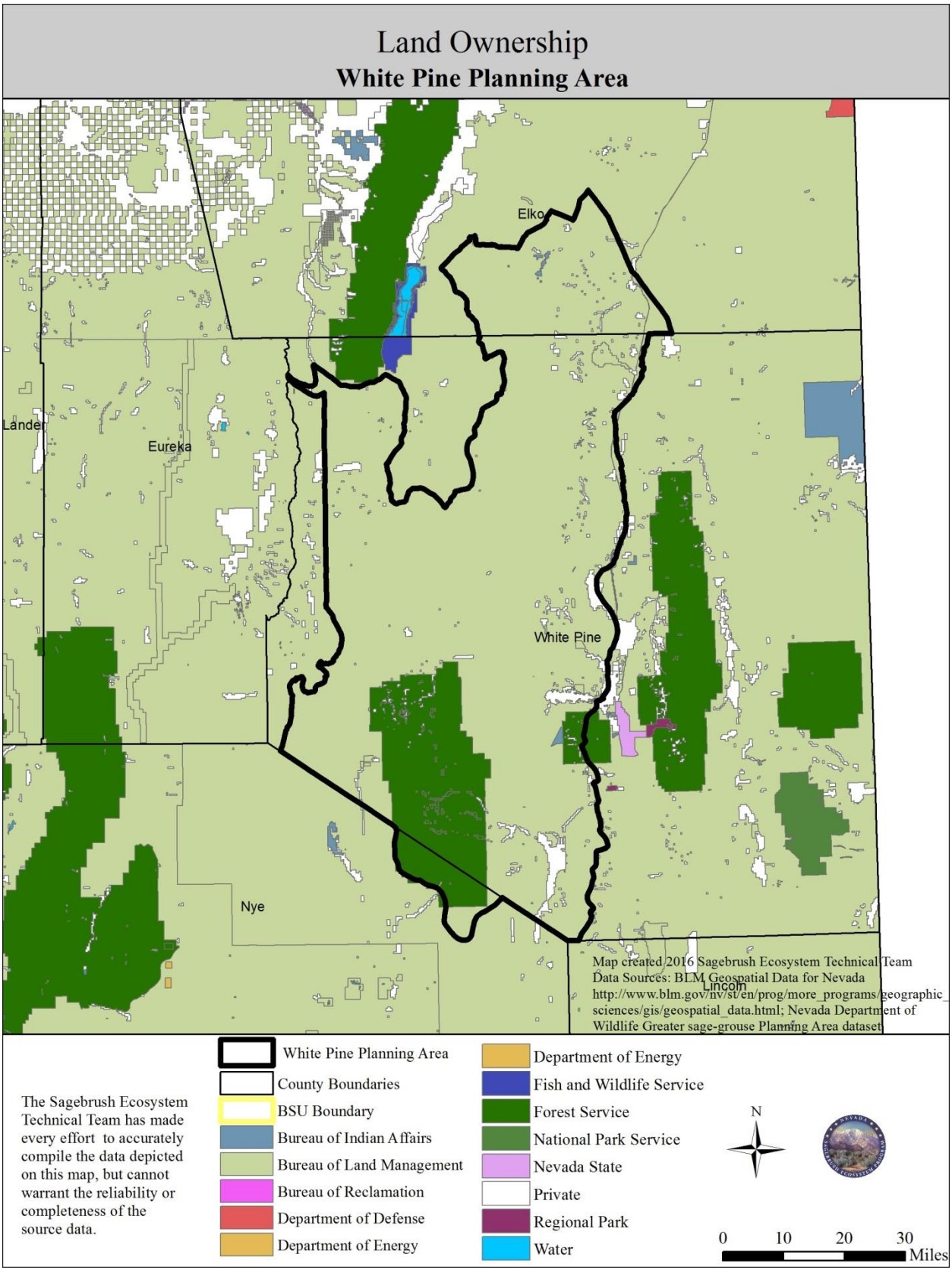
- Prioritize projects based on Key Conservation Strategies provided in this section, threat assessments described above, applicable Management Actions from the State Plan, State PMU Conservation Plans, and other agency or working group planning documents.
- Utilize threat assessment and planning maps by Planning Area and by BSU (provided in Appendices A – F), R&R concepts, FIAT, Rangeland Fire Management Strategy, and other planning documents (provided in *Section 3.0 Project Toolbox*) when developing local management or conservation projects.
- Work with all appropriate partners, LAWGs, agencies, private landowners, and other stakeholders to establish potential funding sources that will maximize efforts, leverage funding, and improve overall efficacy of prioritized projects.
- Develop a public outreach and educational component for both anticipated and completed projects.

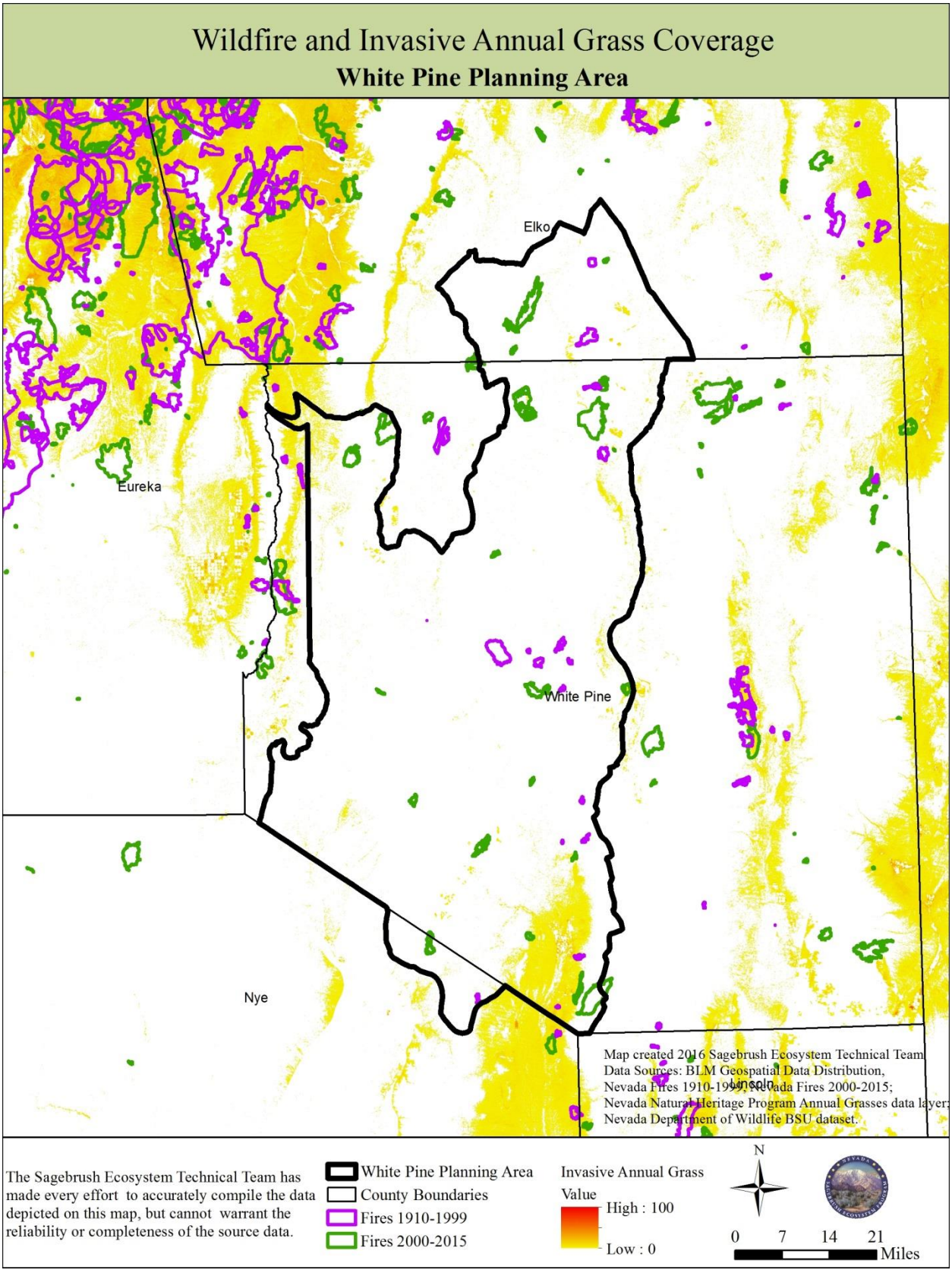
4.6.3.2 Priority Conservation Strategies

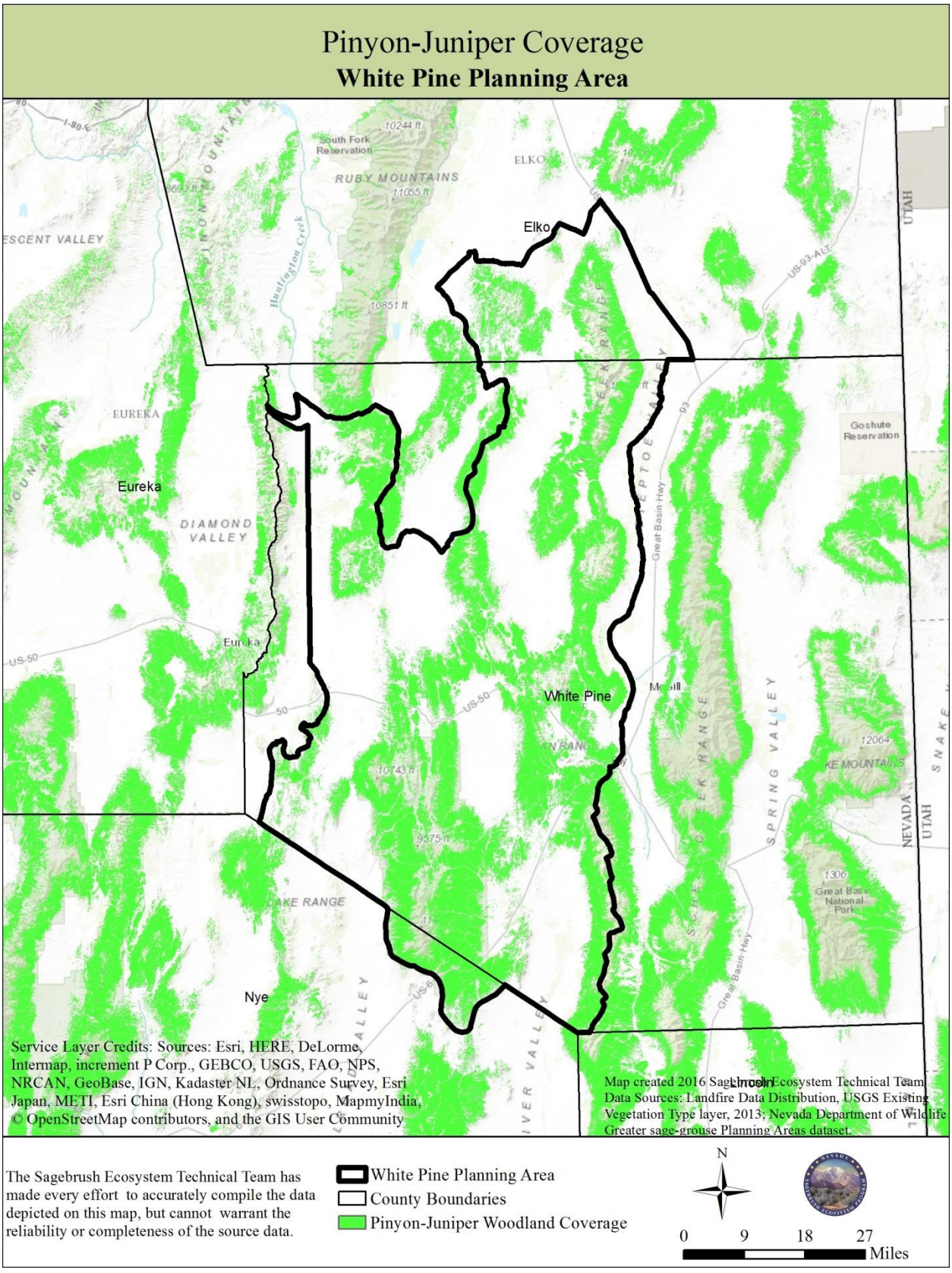
White Pine Planning Area

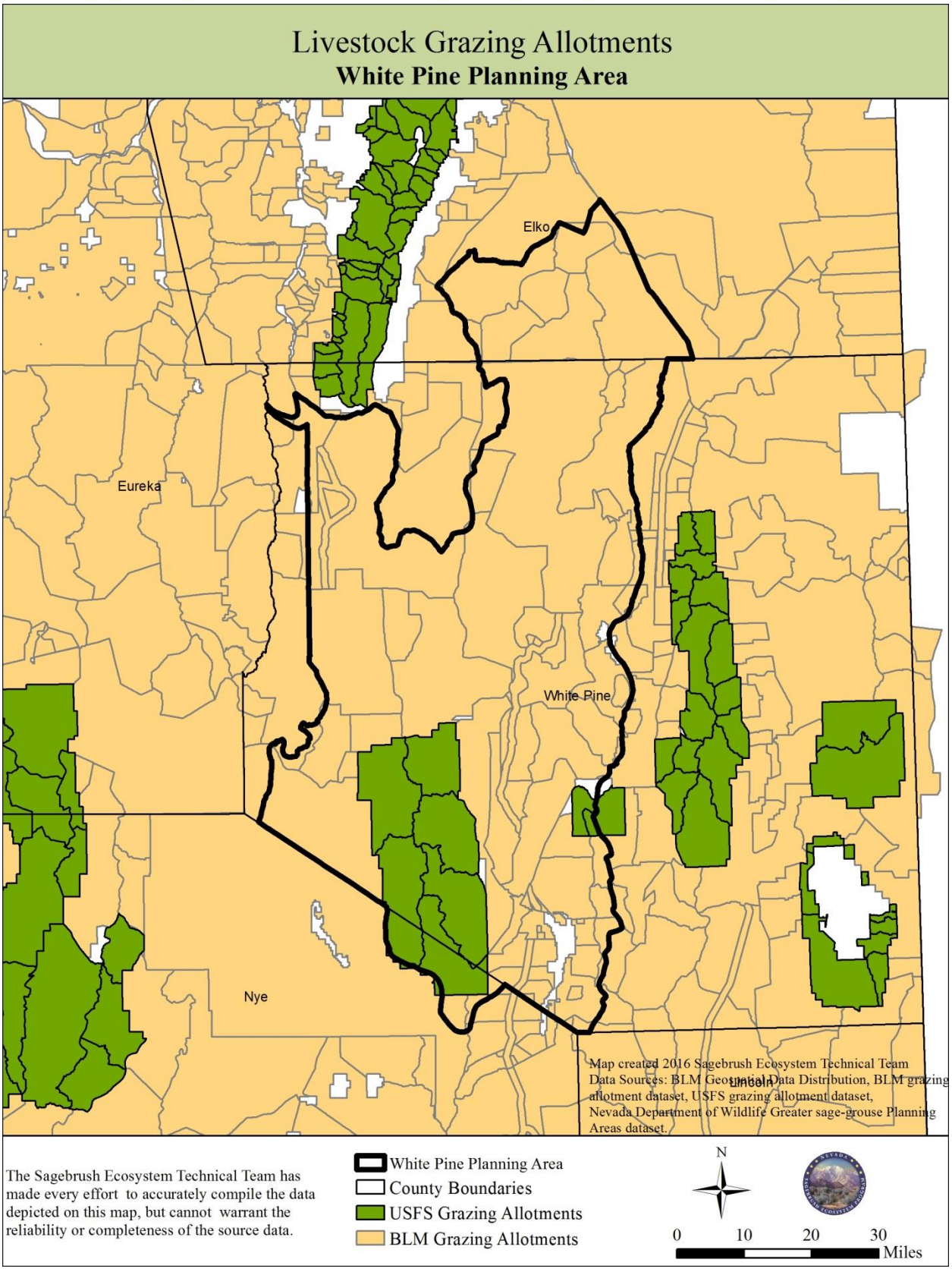
- Prioritize phase I and II P-J removal treatments in SGMAs, particularly near meadow and riparian areas that can be most negatively impacted by conifer encroachment due to high amount of water consumption by P-J trees (citation).
- Protect and enhance late brood-rearing habitats (i.e., riparian areas, corridors from low to higher elevation meadow habitats).
- Analyze opportunities to promote implementation of pre-suppression treatments using R&R concepts, FIAT, and the Rangeland Fire Management Strategy to focus on lower R&R zones.
- Properly implement the Ely BLM District Managed Natural and Prescribed Fire Plan to benefit the ecological processes and systems associated with healthy sagebrush communities (Sage-grouse Conservation Team 2004).
- Focus efforts to stop advancement of invasive and noxious annual grasses
- If cheatgrass is present pre-fire in a low R&R area, the site should be considered for treatment of invasive annual grasses prior to re-seeding.
- Conduct seeding or seedling treatments to re-establish sagebrush and native perennial forbs and grasses immediately following wildfire to maximize probability of habitat recovery.
- Develop a monitoring protocol to document effectiveness of all post-fire treatments or restoration projects.
- Encourage and support management of wild horse and burro populations at AML.
- Develop OHV management plans and consider seasonal road closures and limit off-road use to protect leks and nesting areas during the breeding season.
- Utilize Site Specific Consultation Based Design Features when proposing construction of infrastructure or other anthropogenic structures (SEP 2014).

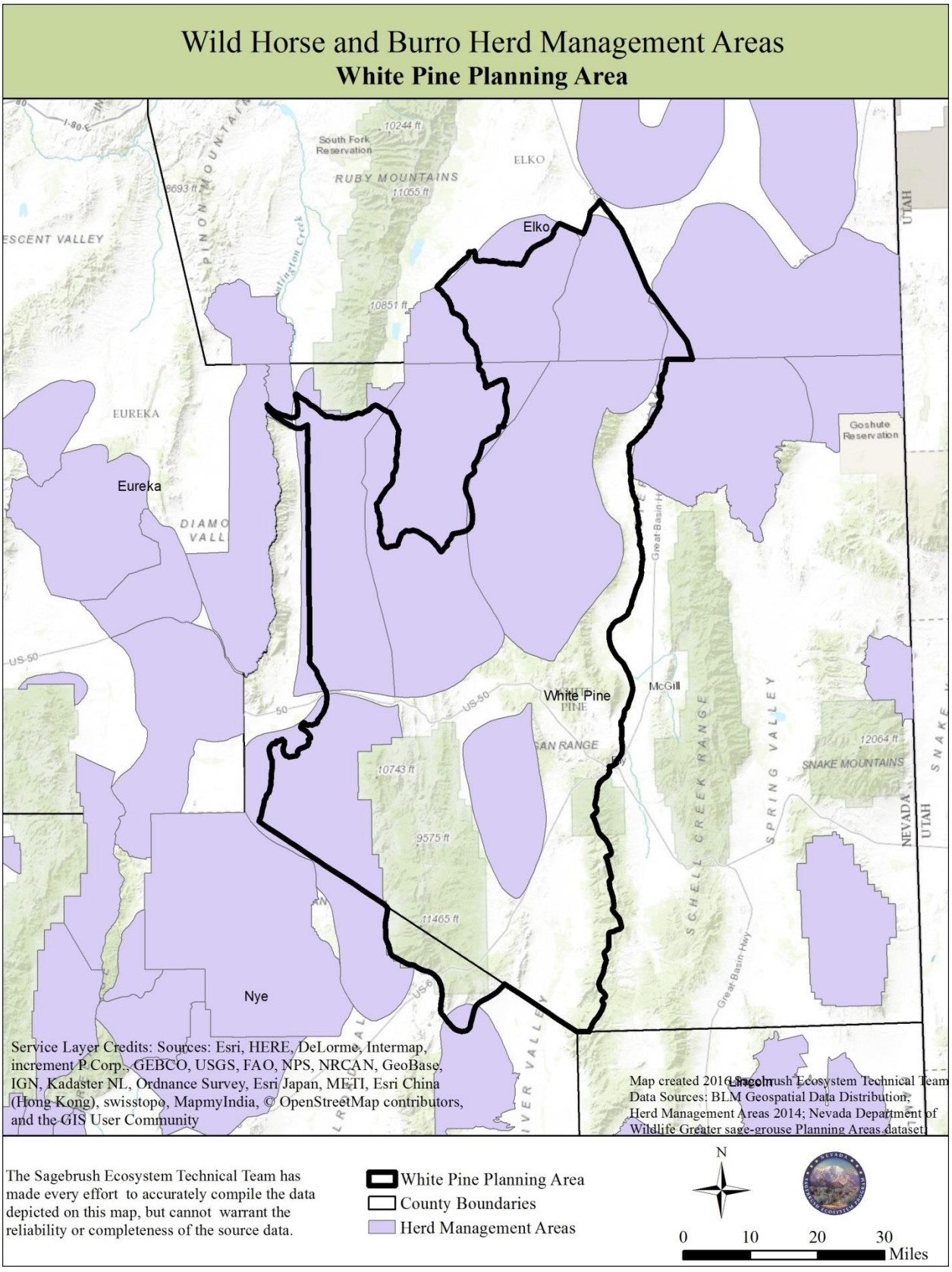

SEP Management Categories
White Pine Planning Area
Elko
Eureka
White Pine
Nye
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: 2015 USGS Management Categories (Coates et al. 2015); Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
SEP Management Categories (December 2015)
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
PHMA
GHMA
OHMA
White Pine Planning Area
County Boundaries
N
0 9 18 27
Miles


Land Ownership
White Pine Planning Area
Elko
Lander
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife Greater sage-grouse Planning Area dataset
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
White Pine Planning Area
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles


Wildfire and Invasive Annual Grass Coverage
White Pine Planning Area
Elko
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999; Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
White Pine Planning Area
County Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass Value
High : 100
Low : 0
N
0 7 14 21
Miles

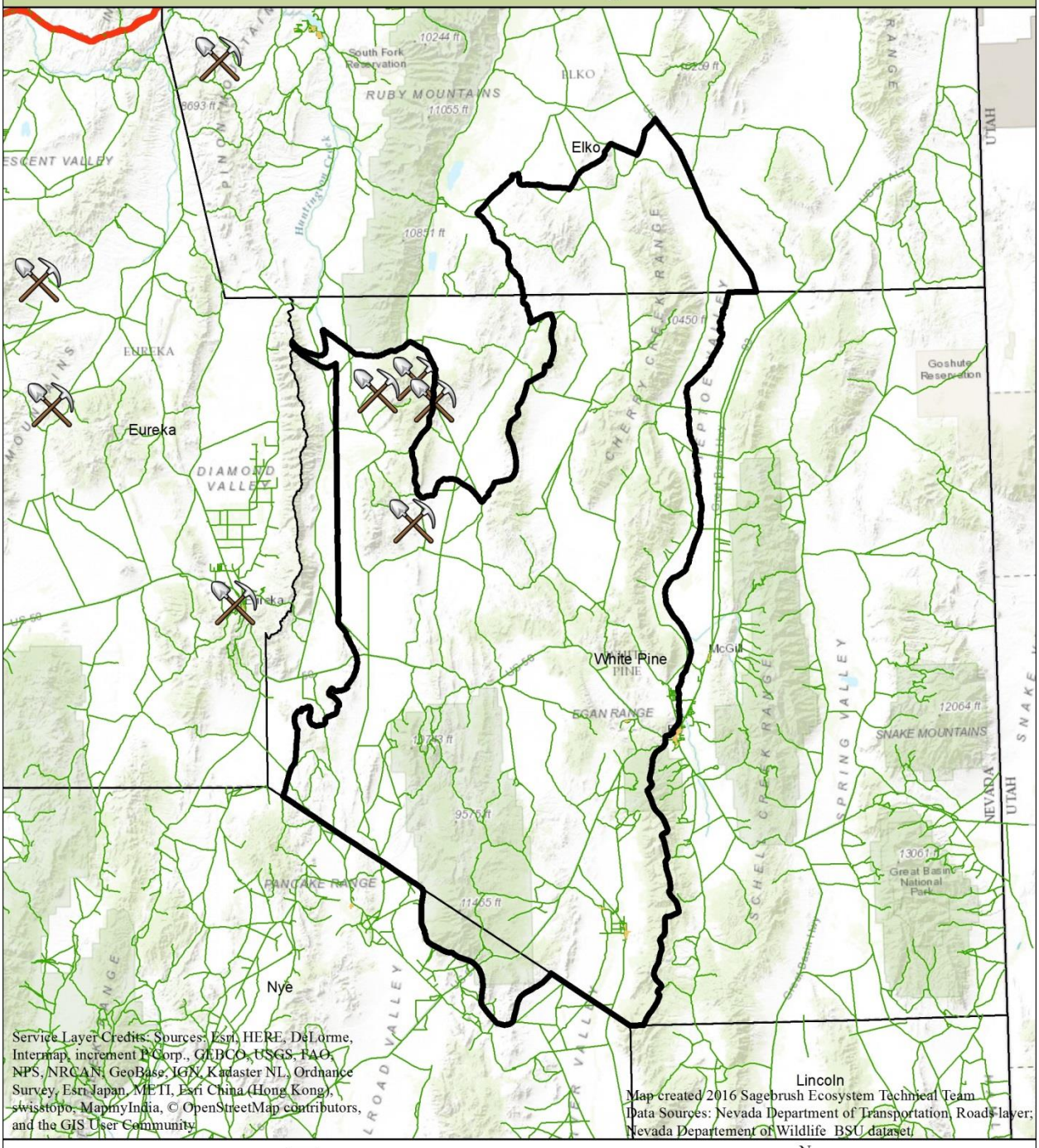

Pinyon-Juniper Coverage
White Pine Planning Area
Elko
Eureka
White Pine
Nye
Lincoln
Goshute Reservation
Great Basin National Park
RUBY MOUNTAINS
DIAMOND VALLEY
SPRING VALLEY
EUREKA
ELKO
UTAH
NEVADA
US-50
US-93
Great Basin Hwy
10244 ft
11055 ft
10851 ft
10743 ft
9375 ft
12064
1306
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
White Pine Planning Area
County Boundaries
Pinyon-Juniper Woodland Coverage
N
0 9 18 27
Miles


Livestock Grazing Allotments
White Pine Planning Area
Elko
Eureka
White Pine
Nye
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
White Pine Planning Area
County Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
White Pine Planning Area
Elko
Eureka
White Pine
Nye
Lincoln
Goshute Reservation
South Fork Reservation
RUBY MOUNTAINS
SNAKE MOUNTAINS
SCHELL CREEK RANGE
SPRING VALLEY
DIAMOND VALLEY
ELKO
EUREKA
PINE
McGill
NEVADA
UTAH
US-50
Great Basin Hwy
10244 ft
11055 ft
10851 ft
10743 ft
9575 ft
11465 ft
12064 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution: Herd Management Areas 2014; Nevada Department of Wildlife Greater sage-grouse Planning Areas dataset
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
White Pine Planning Area
County Boundaries
Herd Management Areas
N
0 10 20 30
Miles

Anthropogenic Disturbance (Roads, Mines, Urban)

White Pine Planning Area



The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

White Pine Planning Area
County Boundaries
Mines
Urban
Roads
1 - INTERSTATE
Arterials and Collectors

N

0 9 18 27 Miles

4.7 REFERENCES

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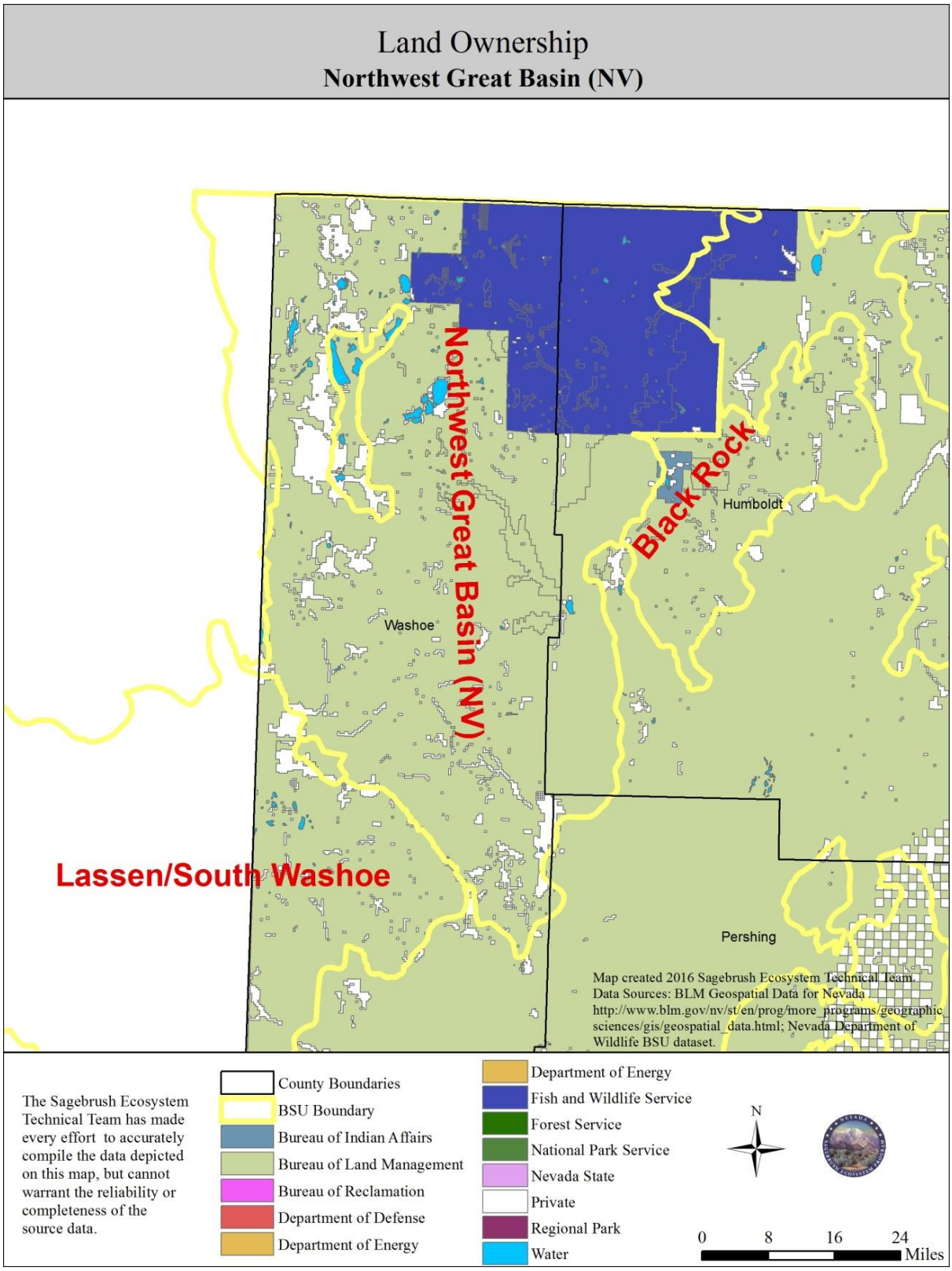
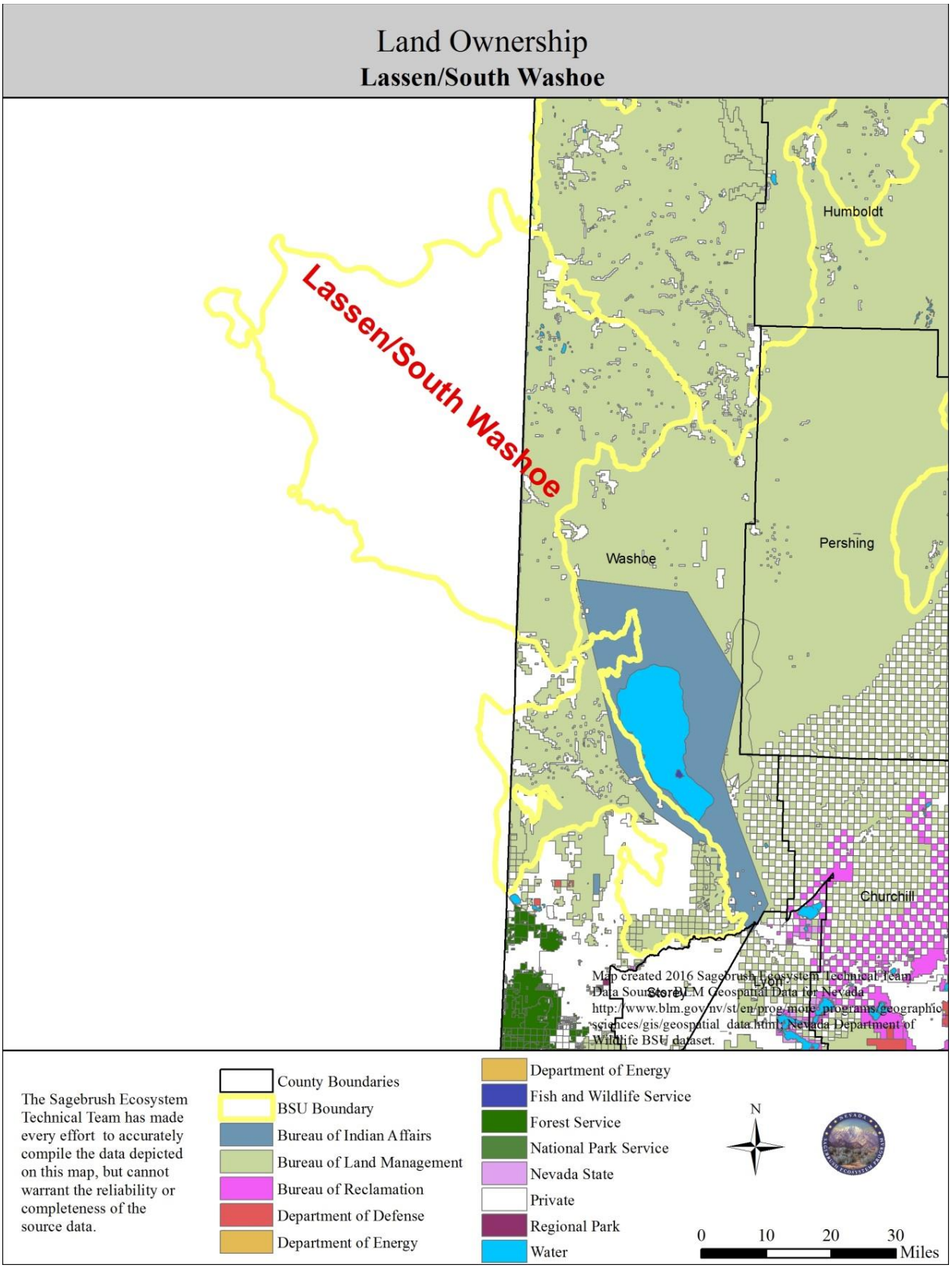
4.8 APPENDICES

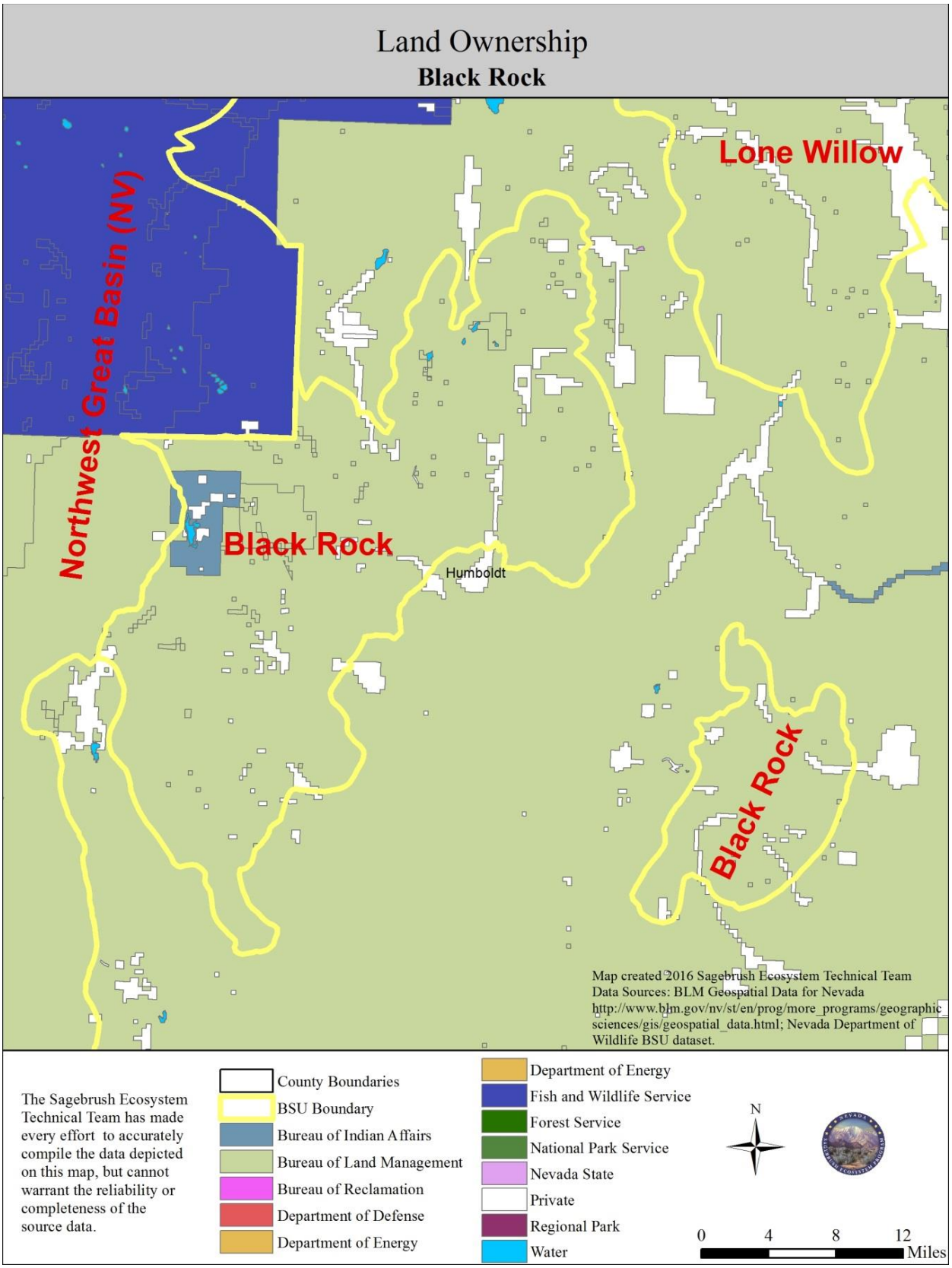
Appendix A: Land Ownership by BSU
Appendix B: Wildfire and Invasive Annual Grass Coverage by BSU
Appendix C: P-J Coverage by BSU
Appendix D: BLM and USFS Grazing Allotments by BSU
Appendix E: Wild Horse and Burro Herd Management Areas by BSU
Appendix F: Anthropogenic Disturbance (Roads, Mines, Urban) by BSU

Appendix A. Land ownership by BSU

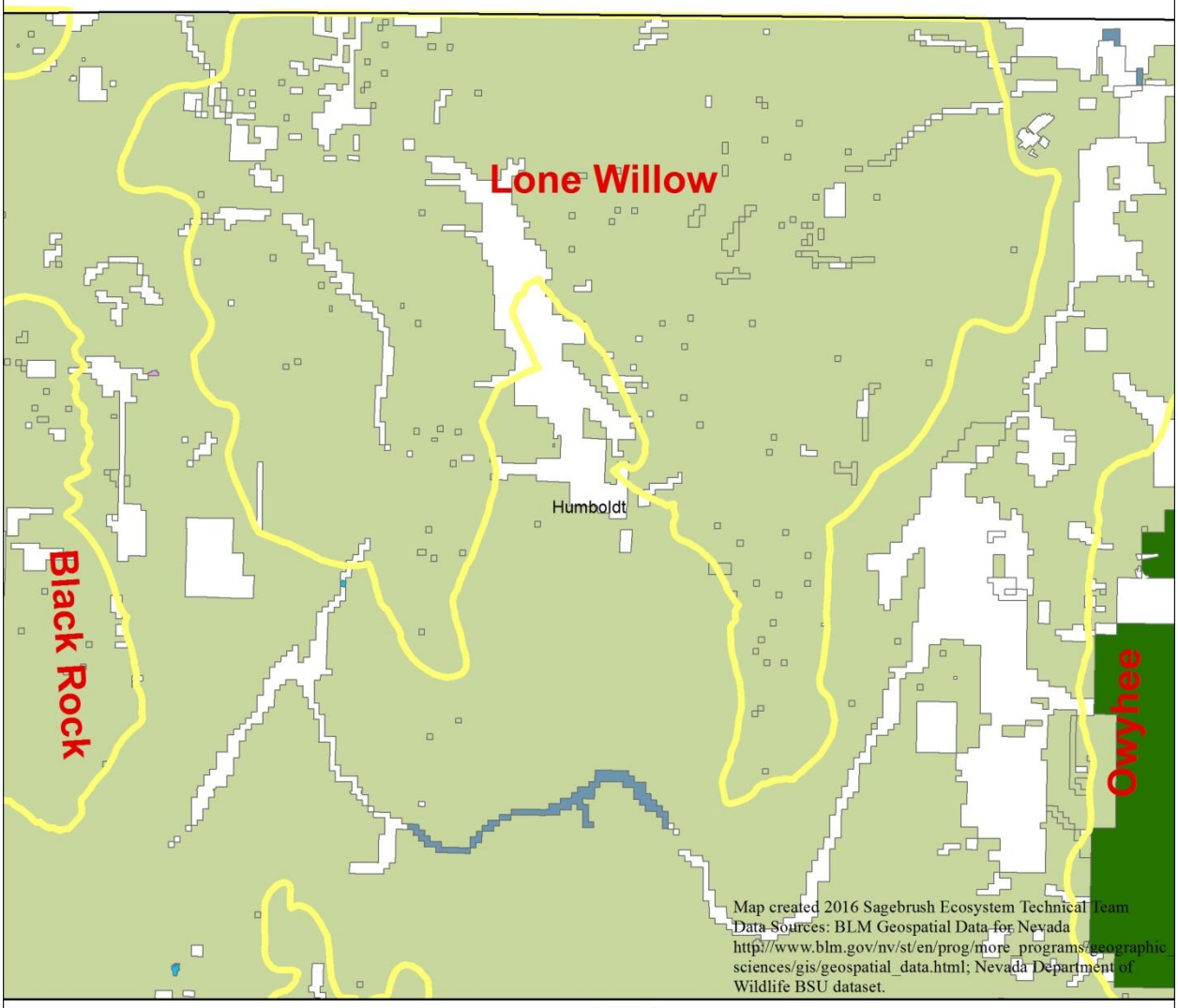



Land Ownership
Lassen/South Washoe
Lassen/South Washoe
Humboldt
Washoe
Pershing
Churchill
Lyon
Storey
Map created 2016 Sagebrush Ecosystem Technical Team
Data Source: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles

DRAFT


Land Ownership
Black Rock
Lone Willow
Northwest Great Basin (NV)
Black Rock
Humboldt
Black Rock
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 4 8 12
Miles

Land Ownership
Lone Willow

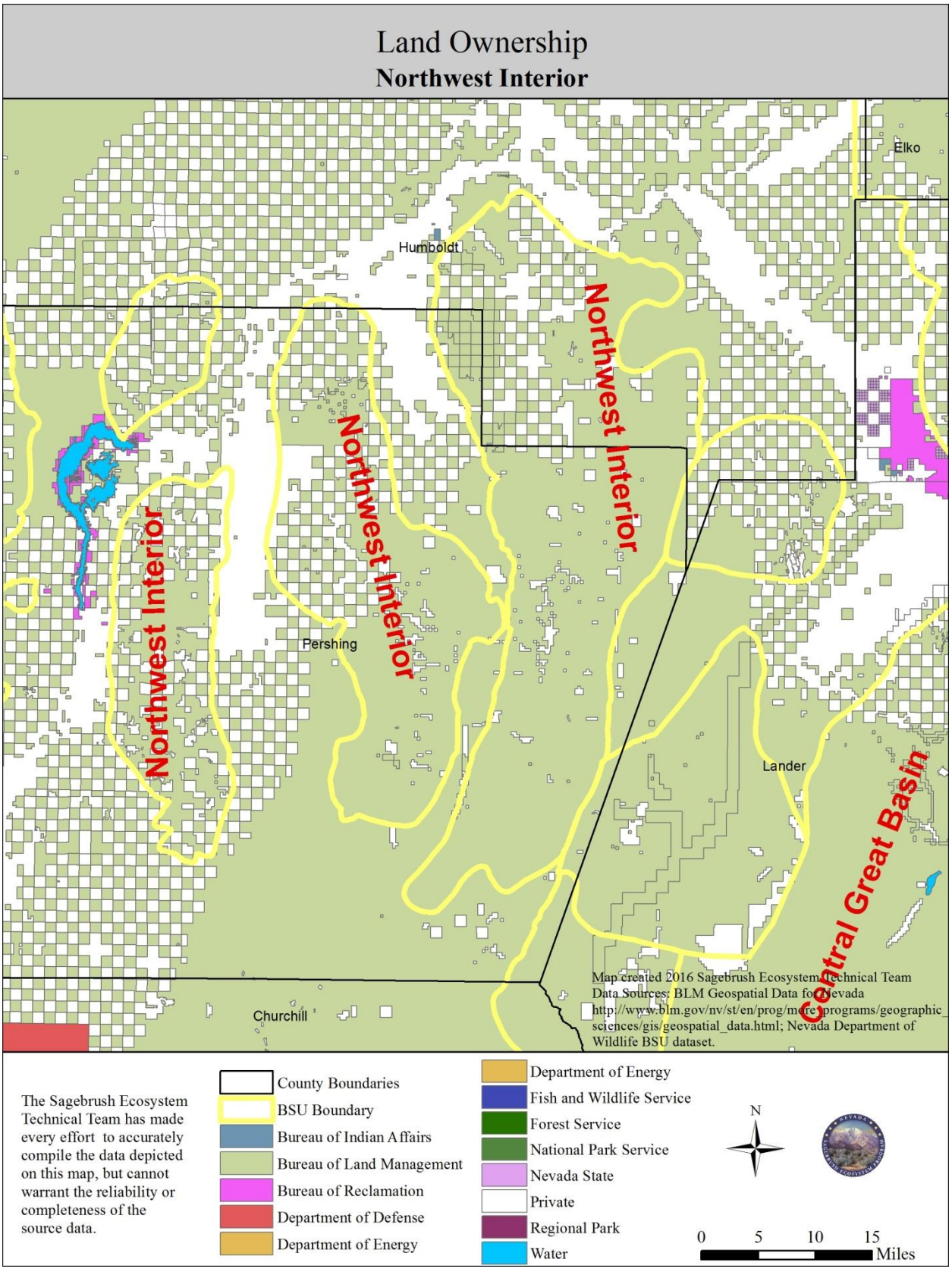


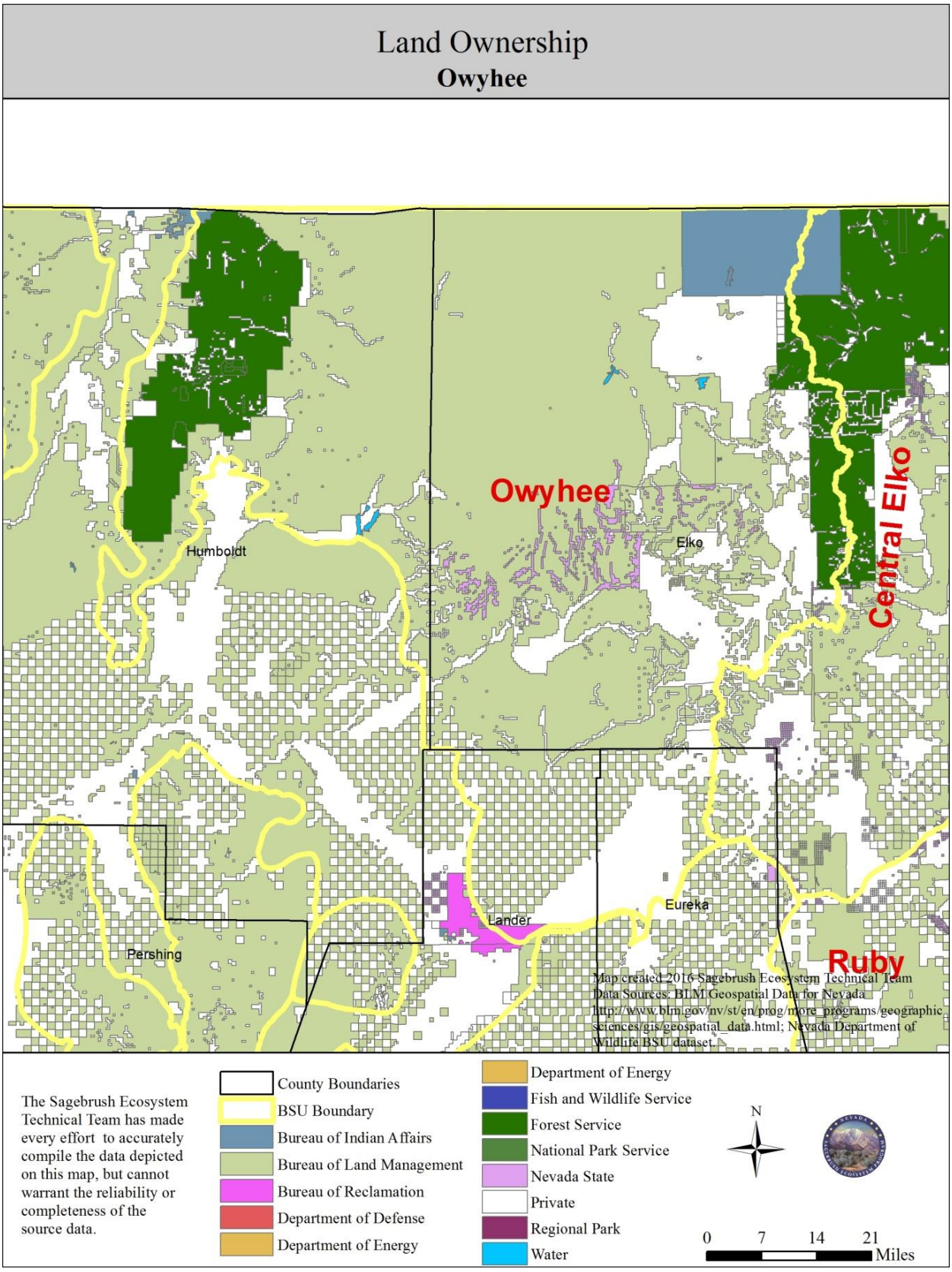
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

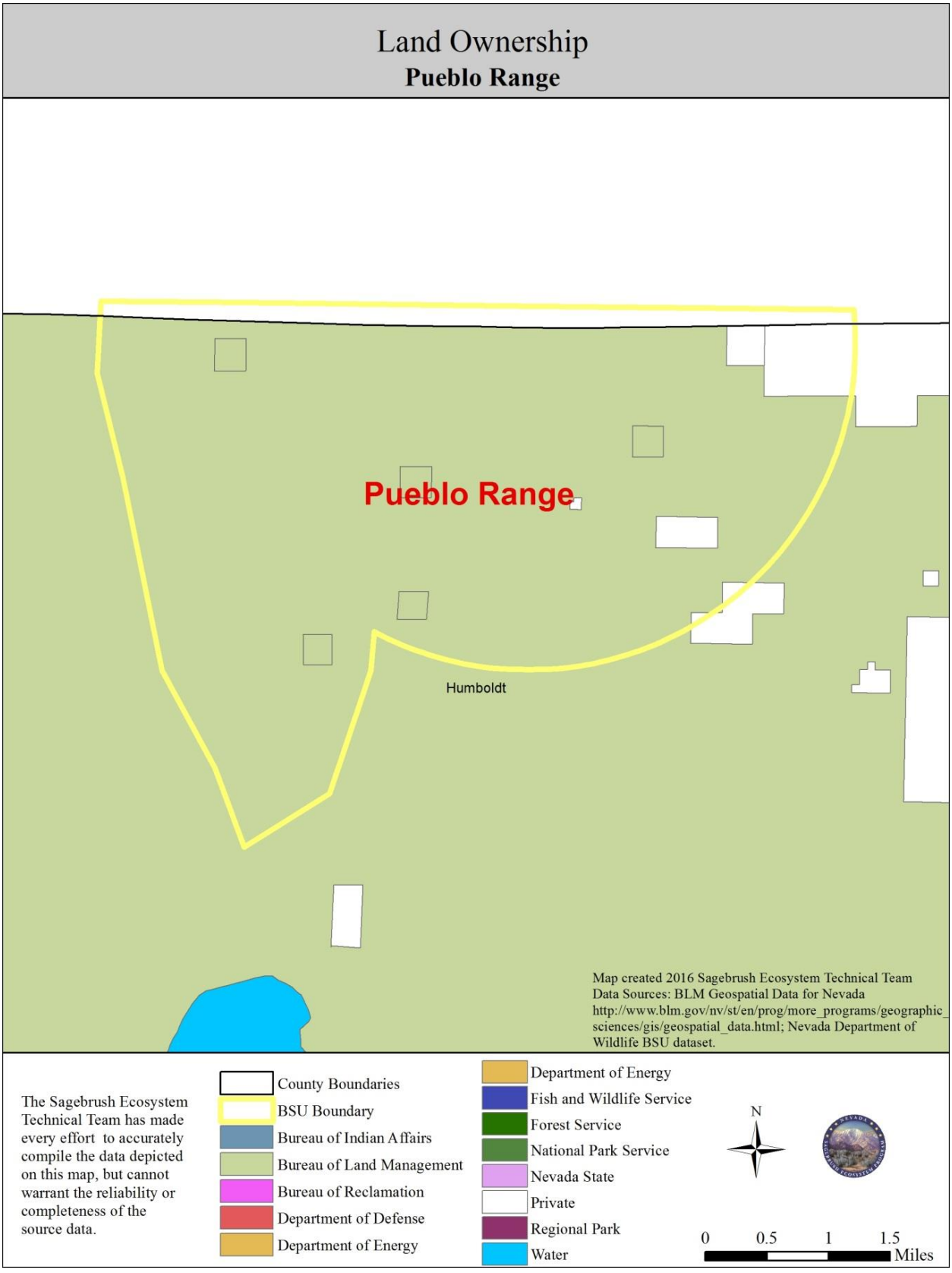
- County Boundaries
- BSU Boundary
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Department of Energy
- Department of Energy
- Fish and Wildlife Service
- Forest Service
- National Park Service
- Nevada State
- Private
- Regional Park
- Water

N

0 3 6 9 Miles


Land Ownership
Northwest Interior
Elko
Humboldt
Northwest Interior
Northwest Interior
Northwest Interior
Pershing
Lander
Central Great Basin
Churchill
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 5 10 15
Miles


Land Ownership
Owyhee
Owyhee
Humboldt
Elko
Central Elko
Lander
Eureka
Pershing
Ruby
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 7 14 21
Miles


Land Ownership
Pueblo Range
Pueblo Range
Humboldt
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_
sciences/gis/geospatial_data.html; Nevada Department of
Wildlife BSU dataset.
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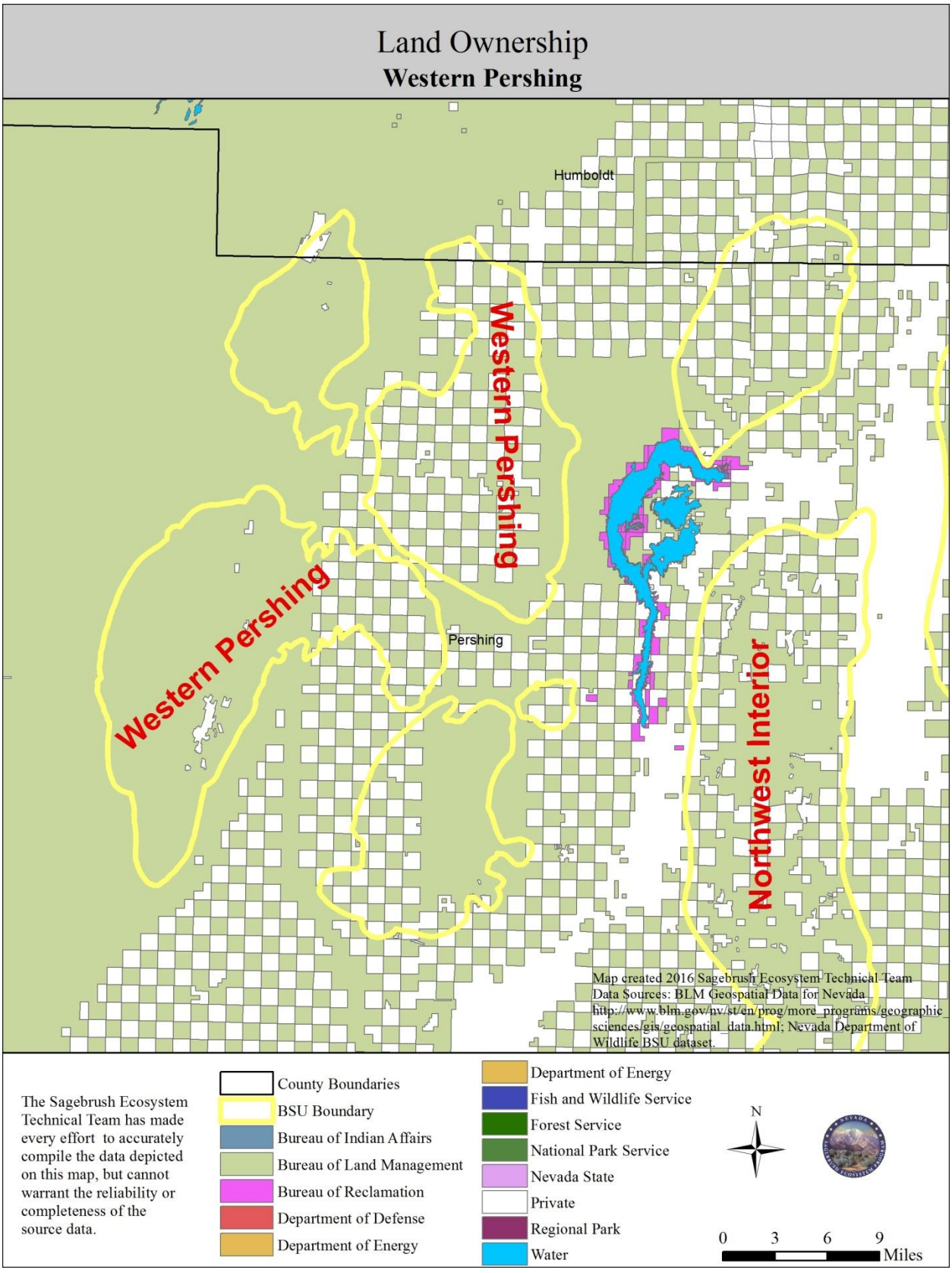
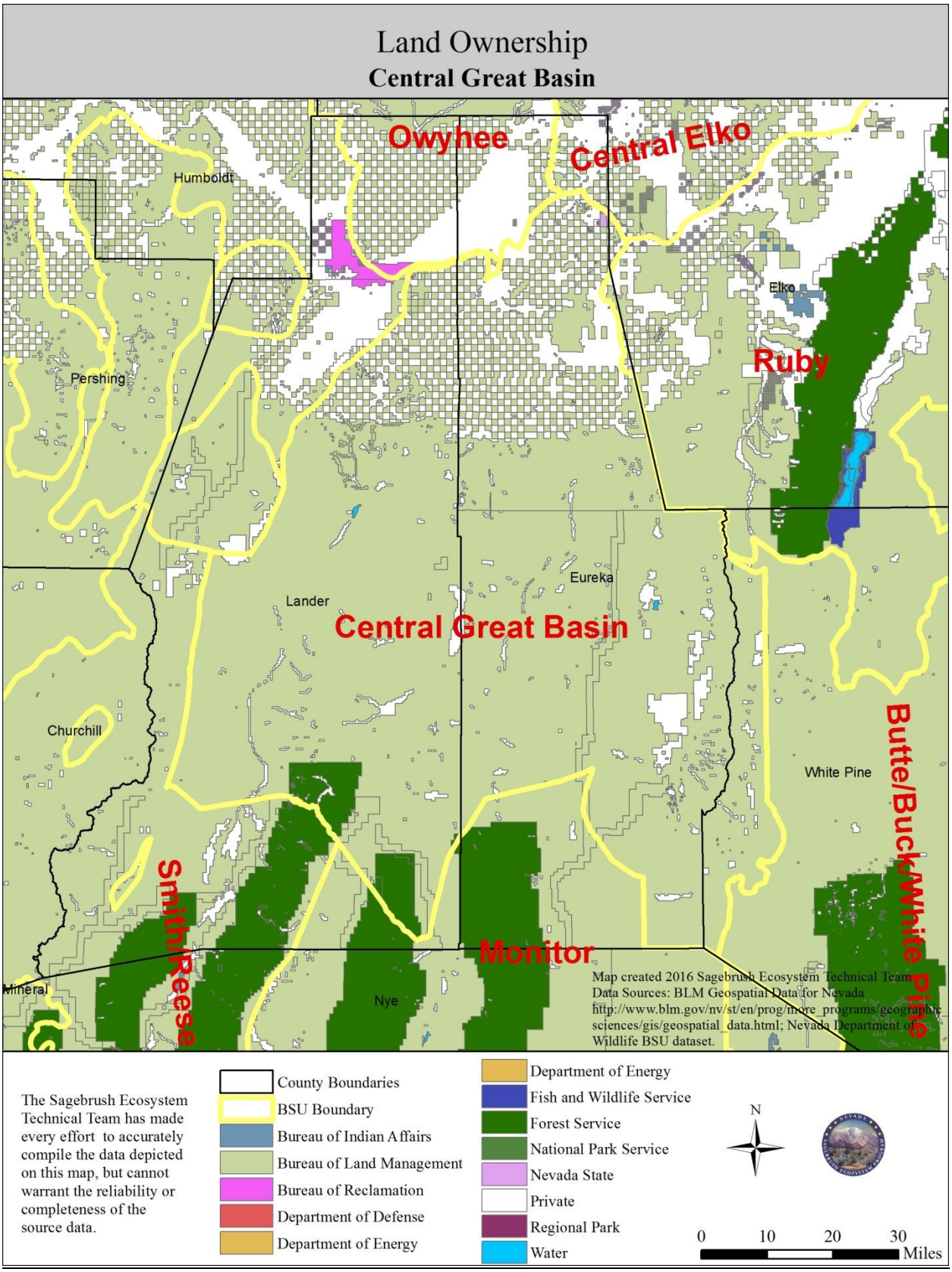
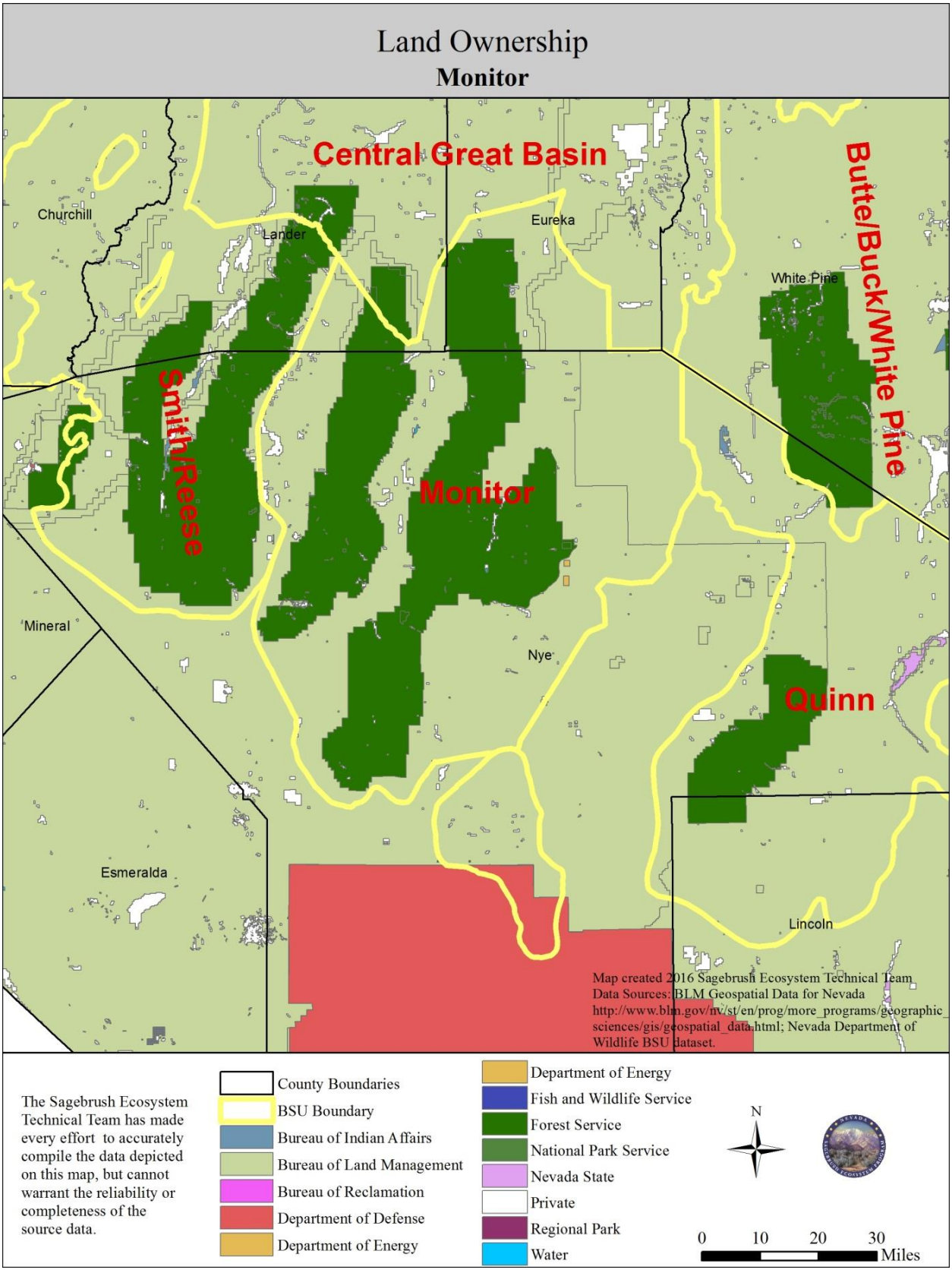
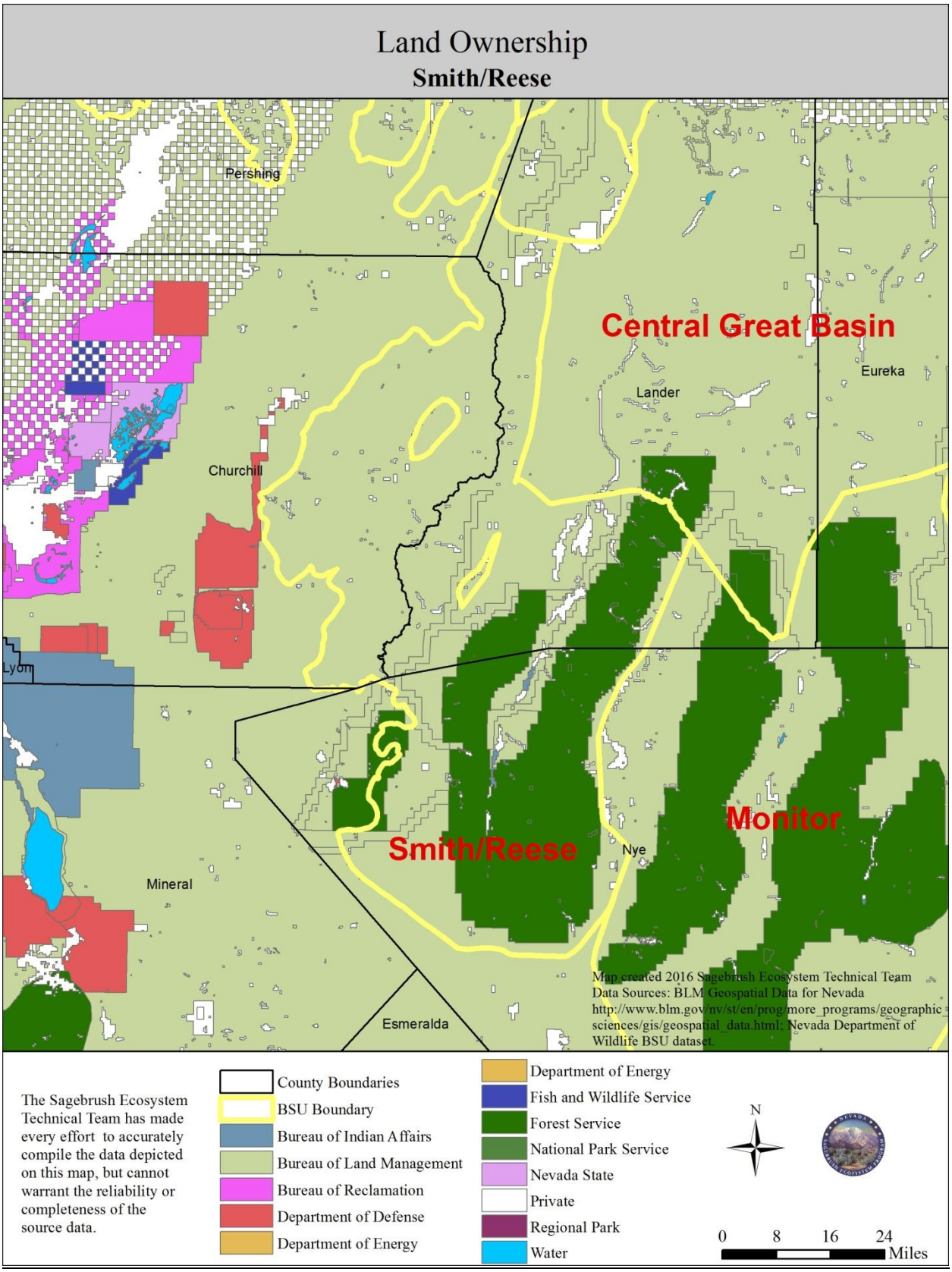
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 0.5 1 1.5
Miles


Land Ownership
Western Pershing
Humboldt
Western Pershing
Western Pershing
Pershing
Northwest Interior
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 3 6 9
Miles

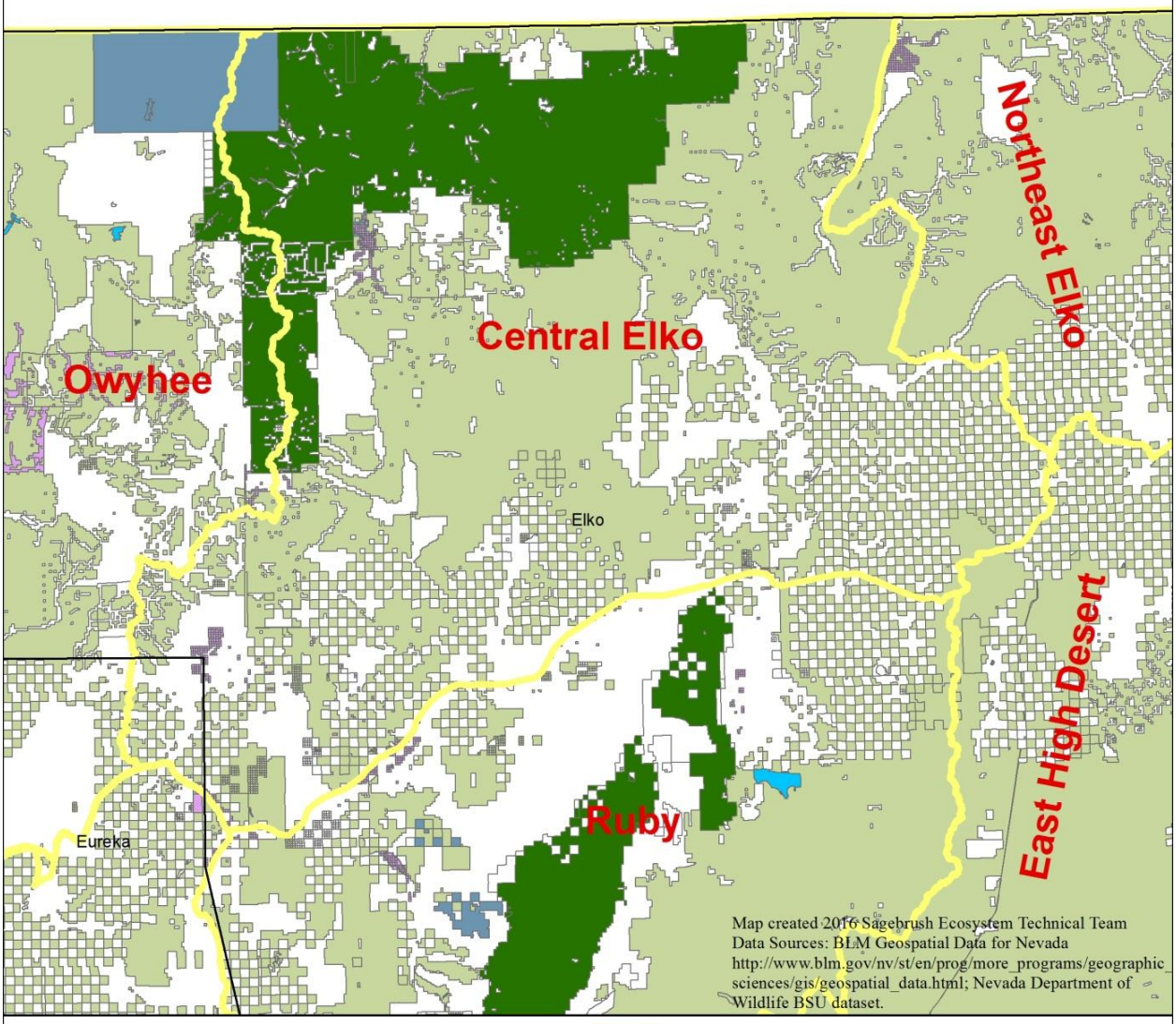

Land Ownership
Central Great Basin
Owyhee
Central Elko
Humboldt
Elko
Ruby
Pershing
Eureka
Lander
Central Great Basin
Churchill
White Pine
Butte/Buck/White Pine
Smith/Reese
Monitor
Mineral
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles


Land Ownership
Monitor
Central Great Basin
Butte/Buck/White Pine
Smith/Reese
Monitor
Quinn
Churchill
Lander
Eureka
White Pine
Mineral
Nye
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles


Land Ownership
Smith/Reese
Pershing
Central Great Basin
Eureka
Lander
Churchill
Lyon
Monitor
Smith/Reese
Nye
Mineral
Esmeralda
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 8 16 24
Miles

DRAFT

Land Ownership
Central Elko

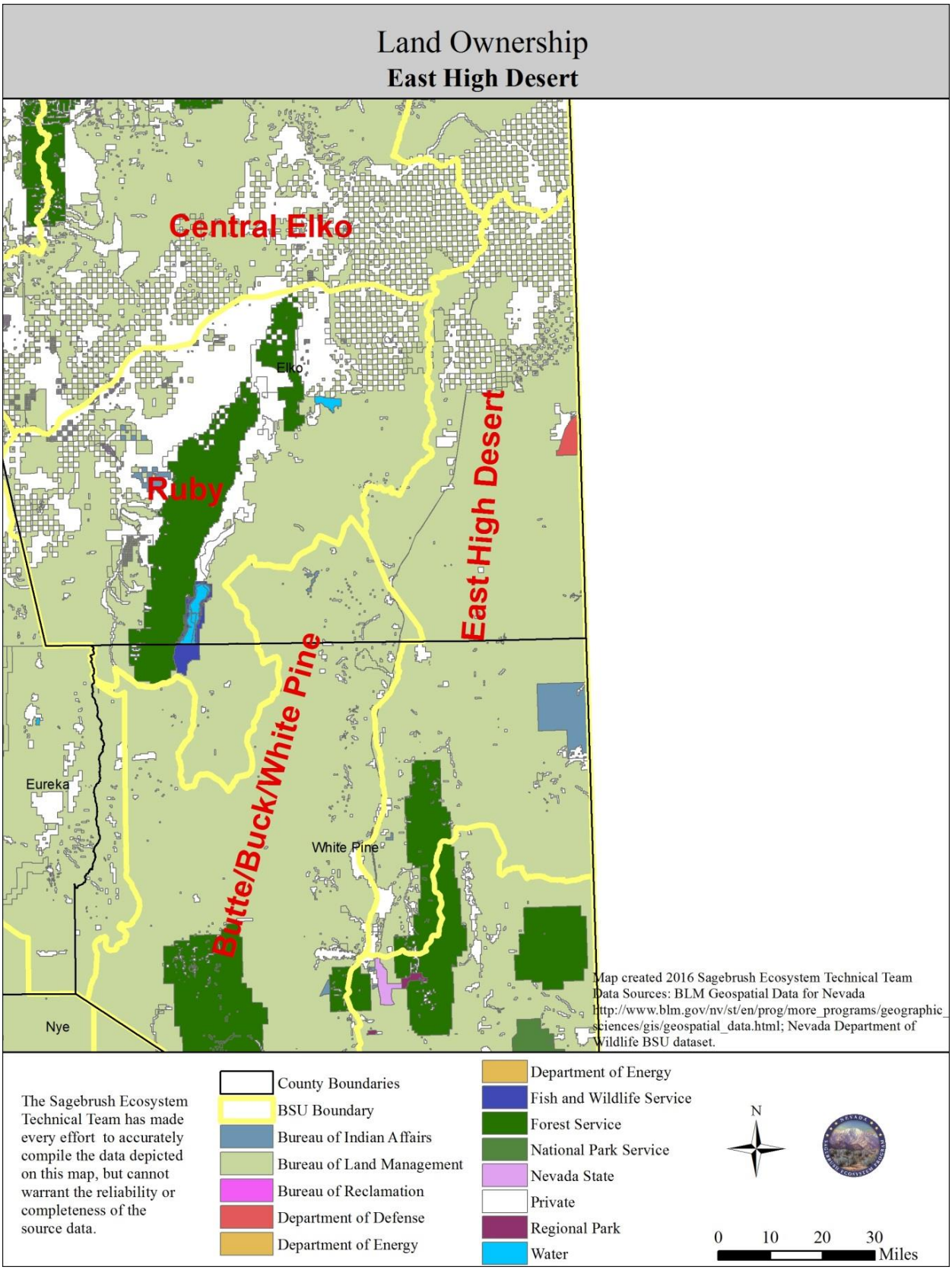


The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

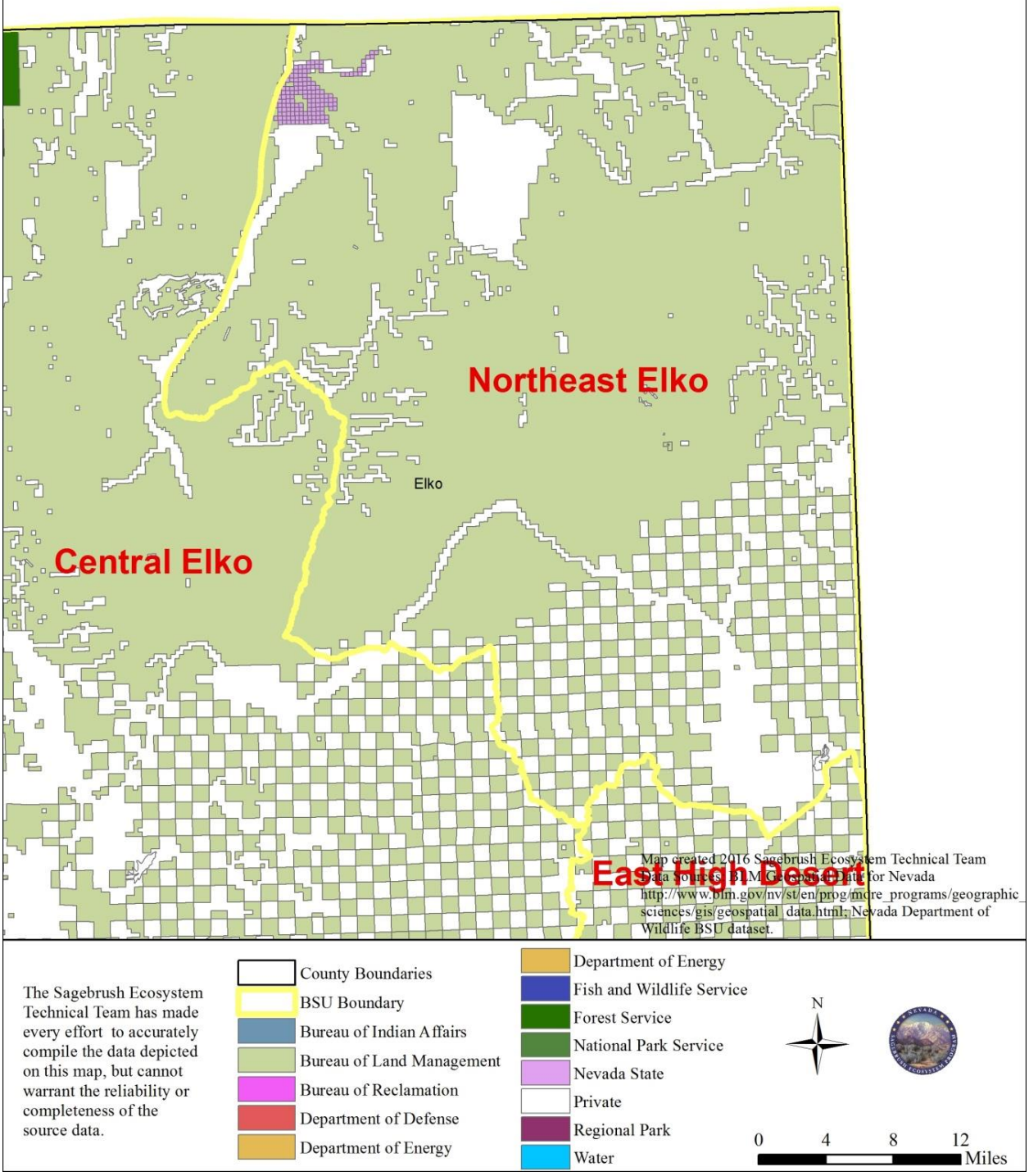
- County Boundaries
- BSU Boundary
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Department of Energy
- Department of Energy
- Fish and Wildlife Service
- Forest Service
- National Park Service
- Nevada State
- Private
- Regional Park
- Water

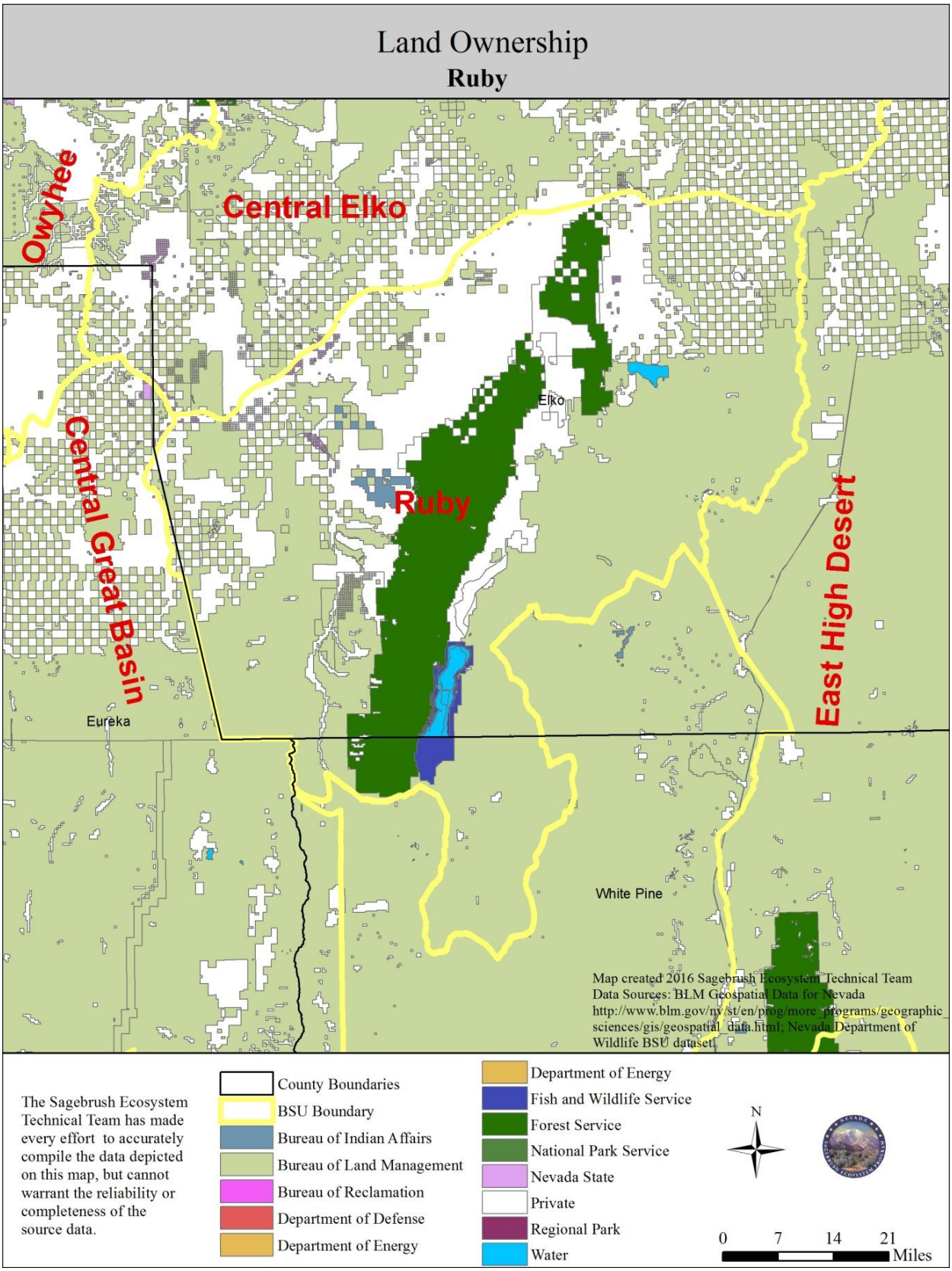
N

0 9 18 27 Miles

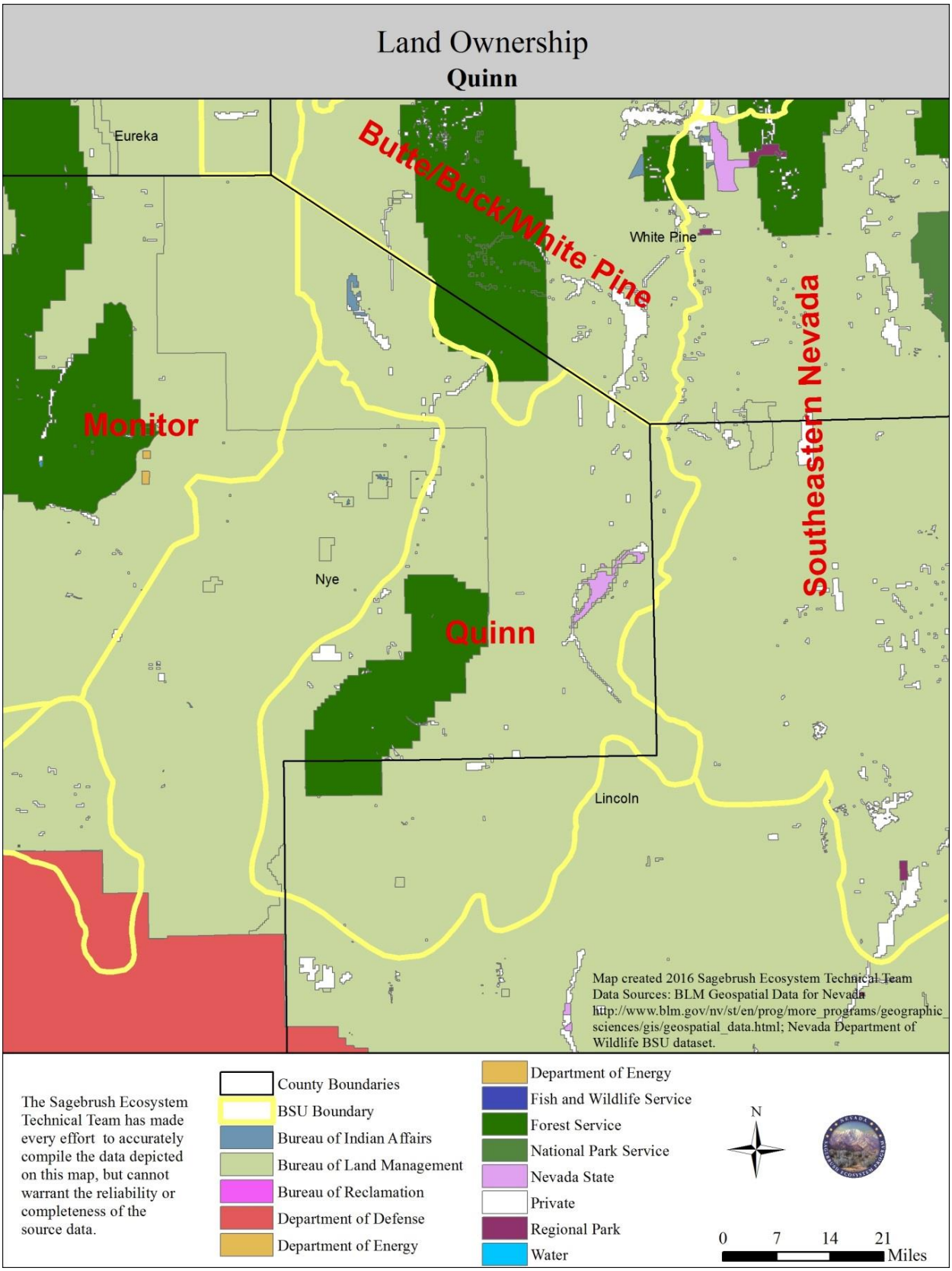

Land Ownership
East High Desert
Central Elko
Elko
Ruby
East High Desert
Butte/Buck/White Pine
Eureka
White Pine
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles

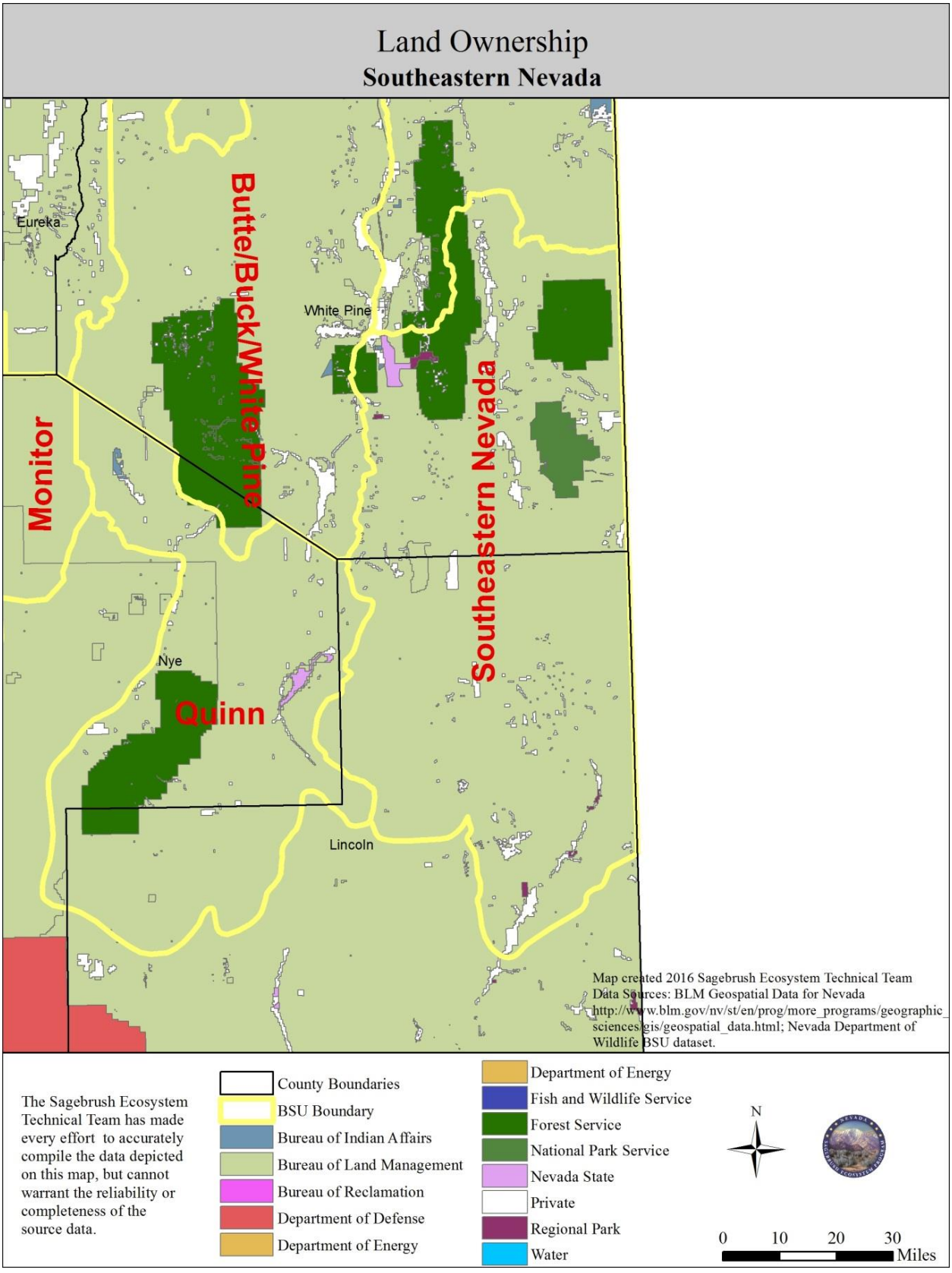
Land Ownership
Northeast Elko

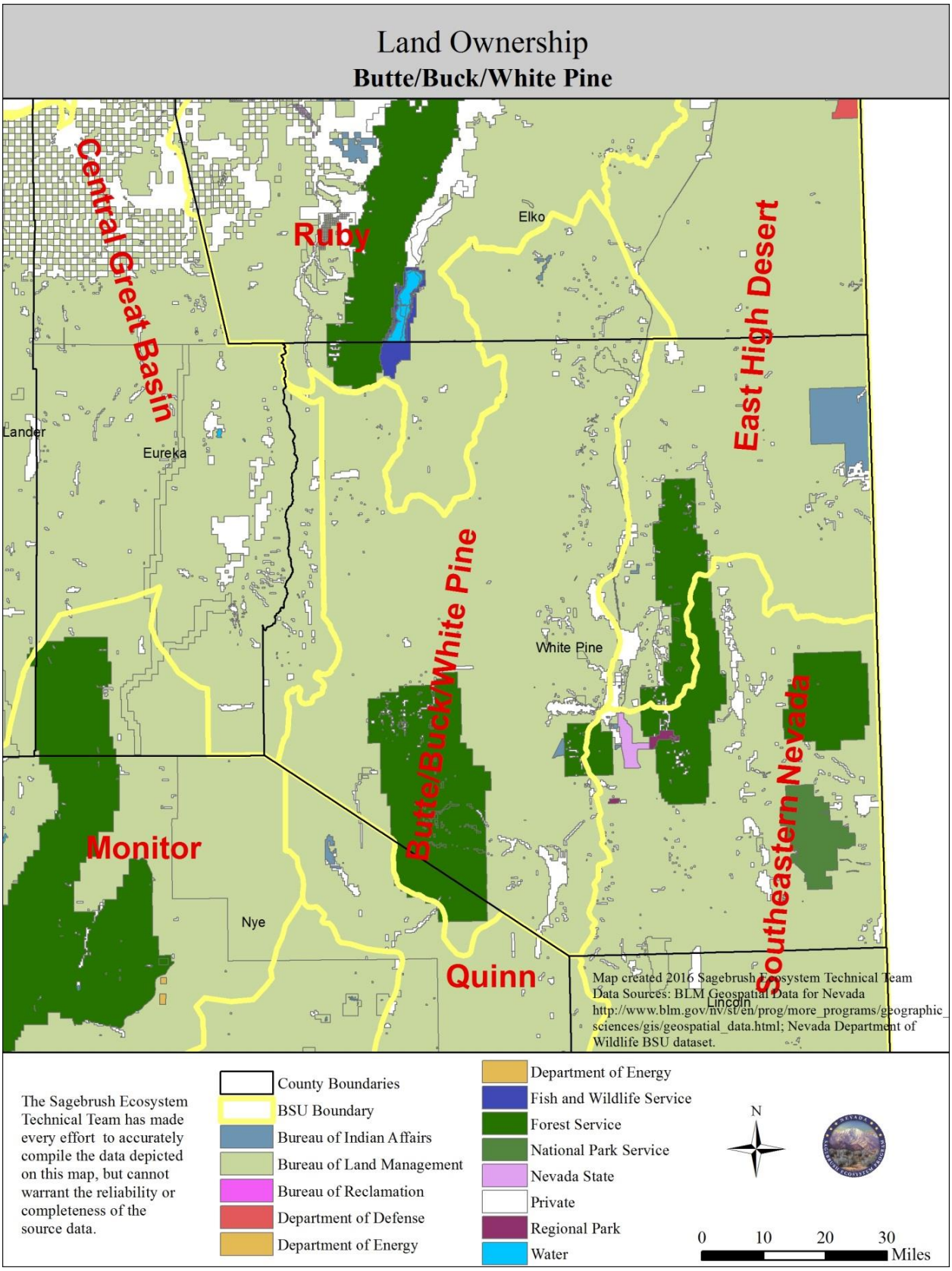



Land Ownership
Ruby
Owyhee
Central Elko
Central Great Basin
Ruby
East High Desert
Elko
Eureka
White Pine
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 7 14 21
Miles

DRAFT

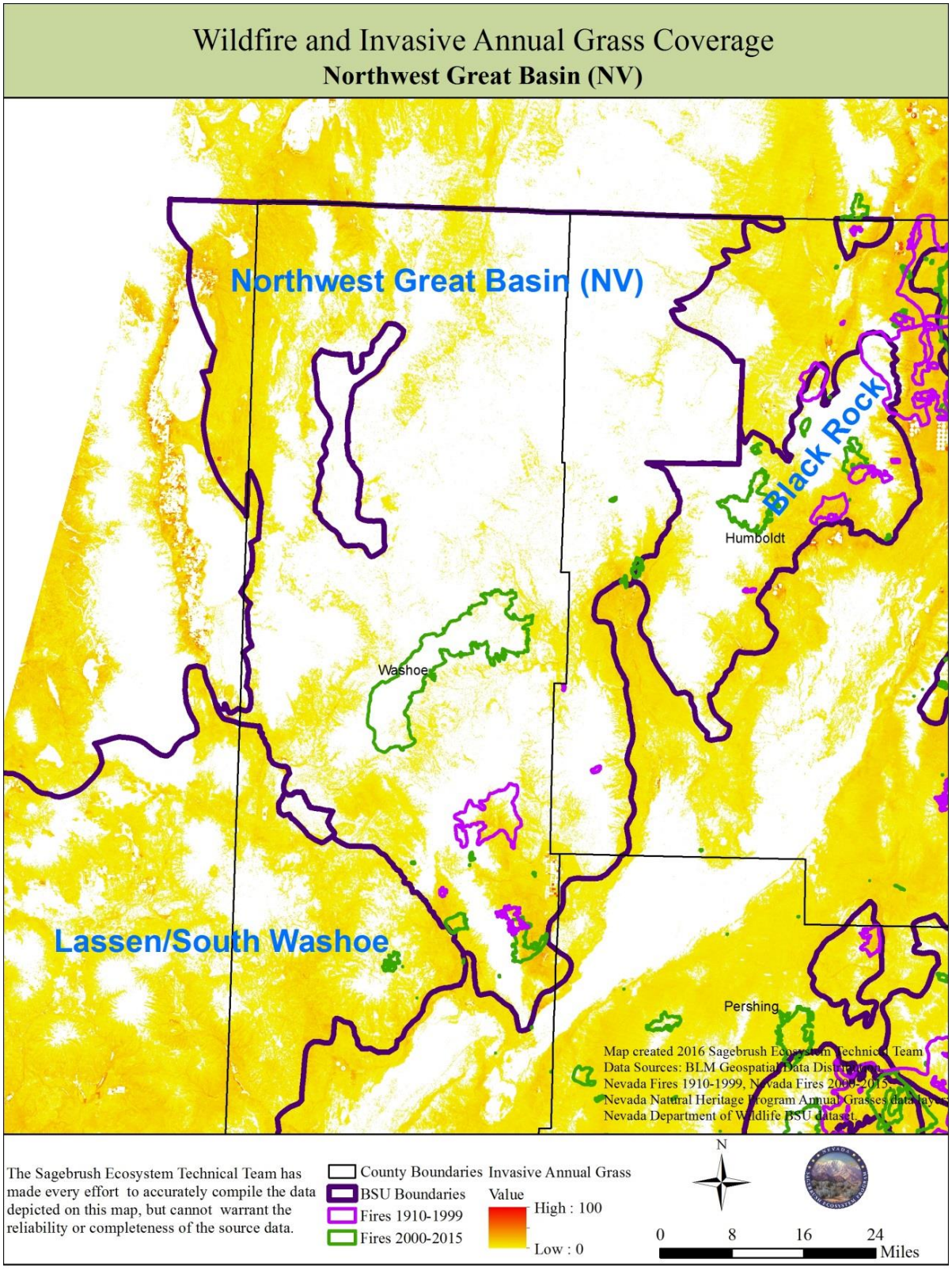

Land Ownership
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Southeastern Nevada
Monitor
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 7 14 21
Miles

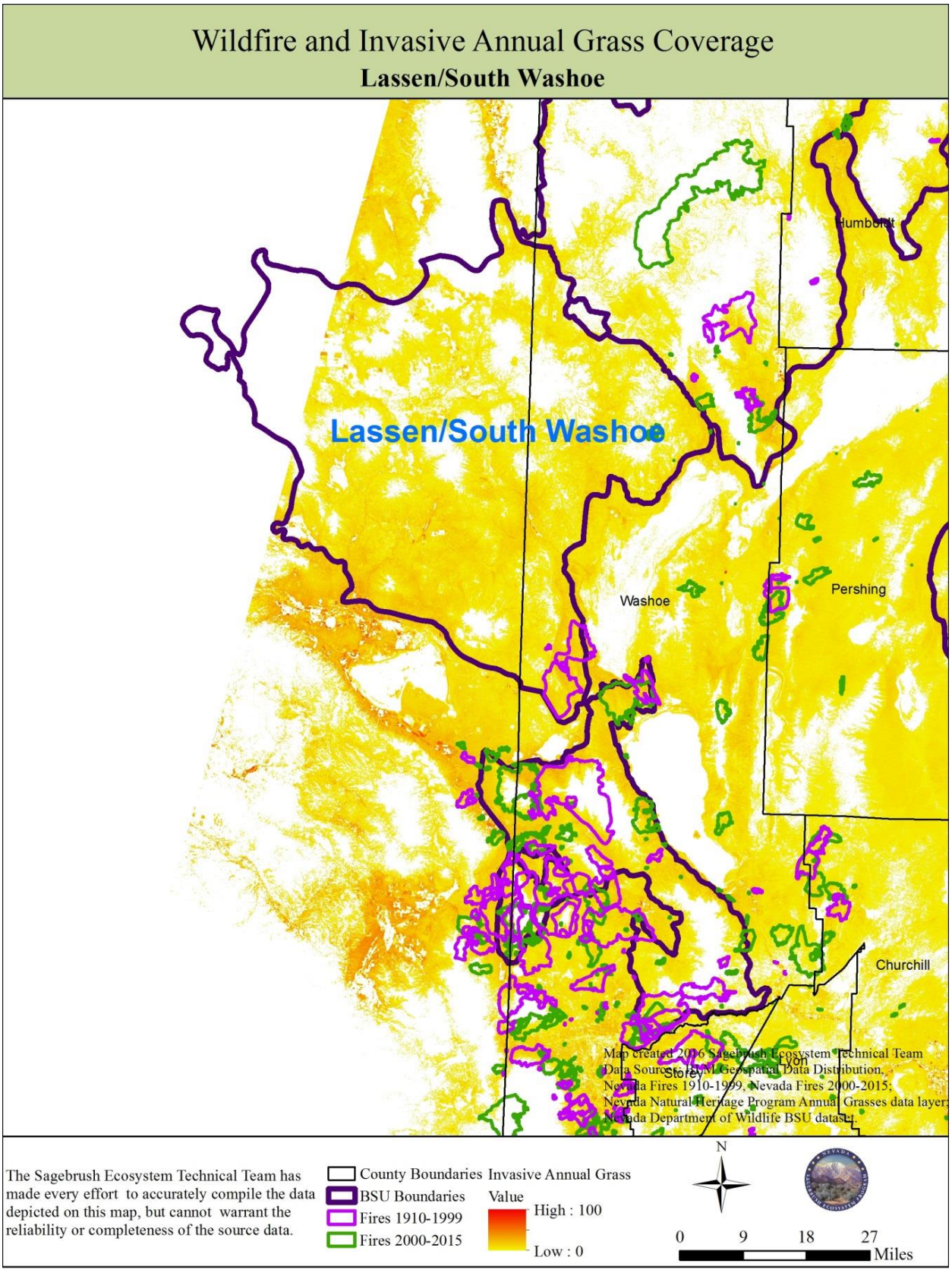

Land Ownership
Southeastern Nevada
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Southeastern Nevada
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles

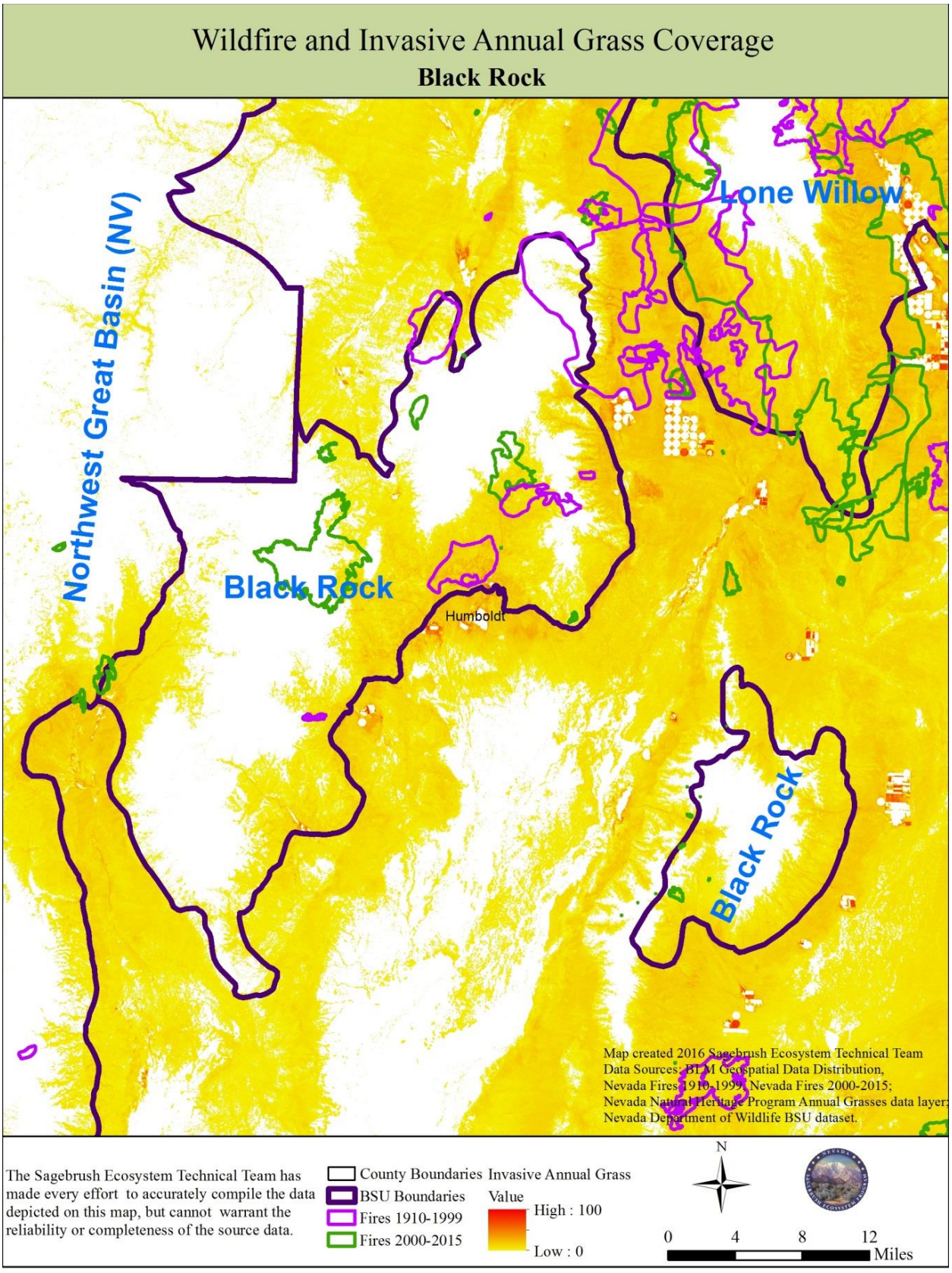

Land Ownership
Butte/Buck/White Pine
Central Great Basin
Ruby
Elko
East High Desert
Lander
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Nye
Quinn
Lincoln
Southeastern Nevada
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data for Nevada
http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Department of Energy
Fish and Wildlife Service
Forest Service
National Park Service
Nevada State
Private
Regional Park
Water
N
0 10 20 30
Miles

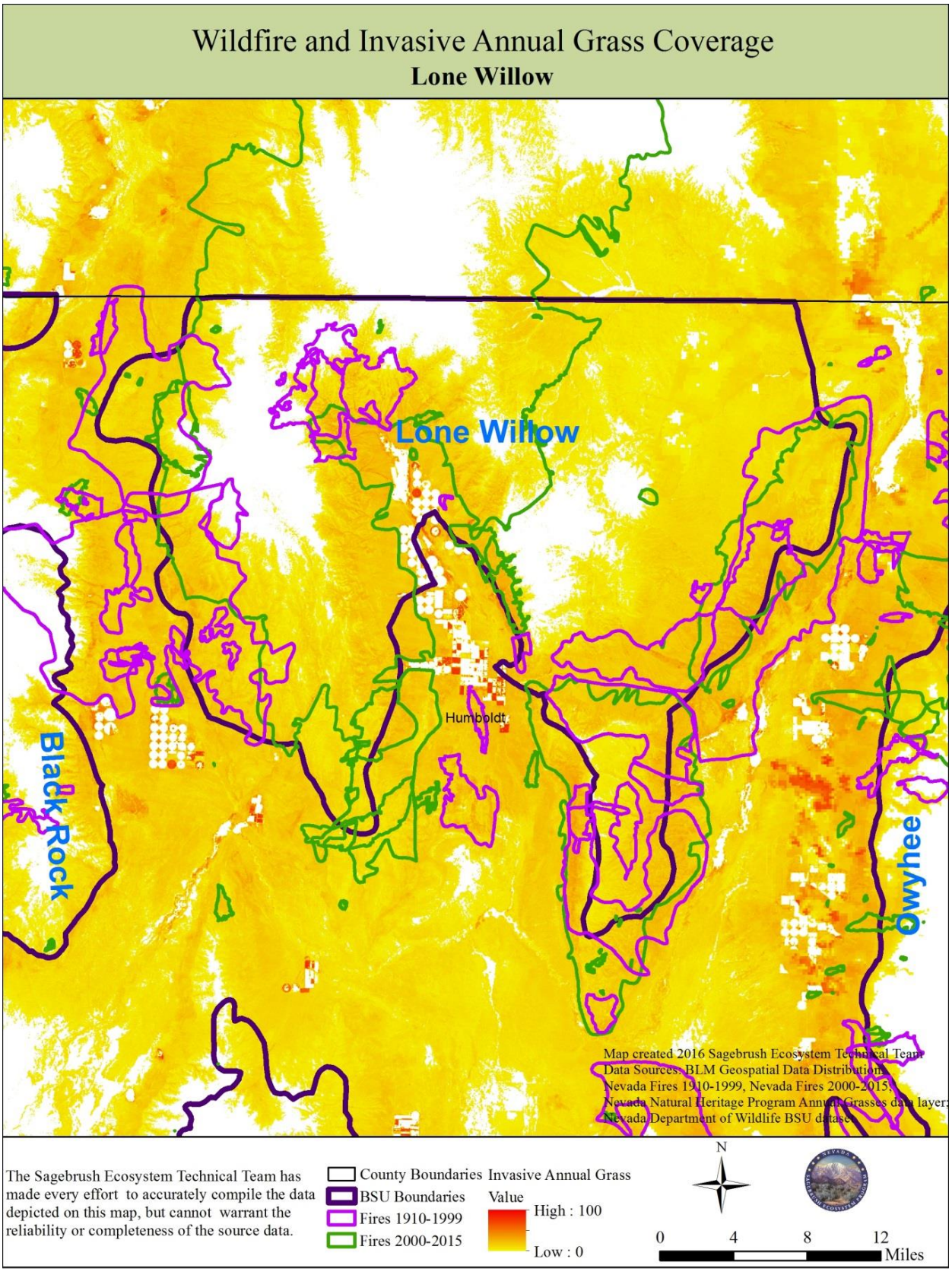
DRAFT

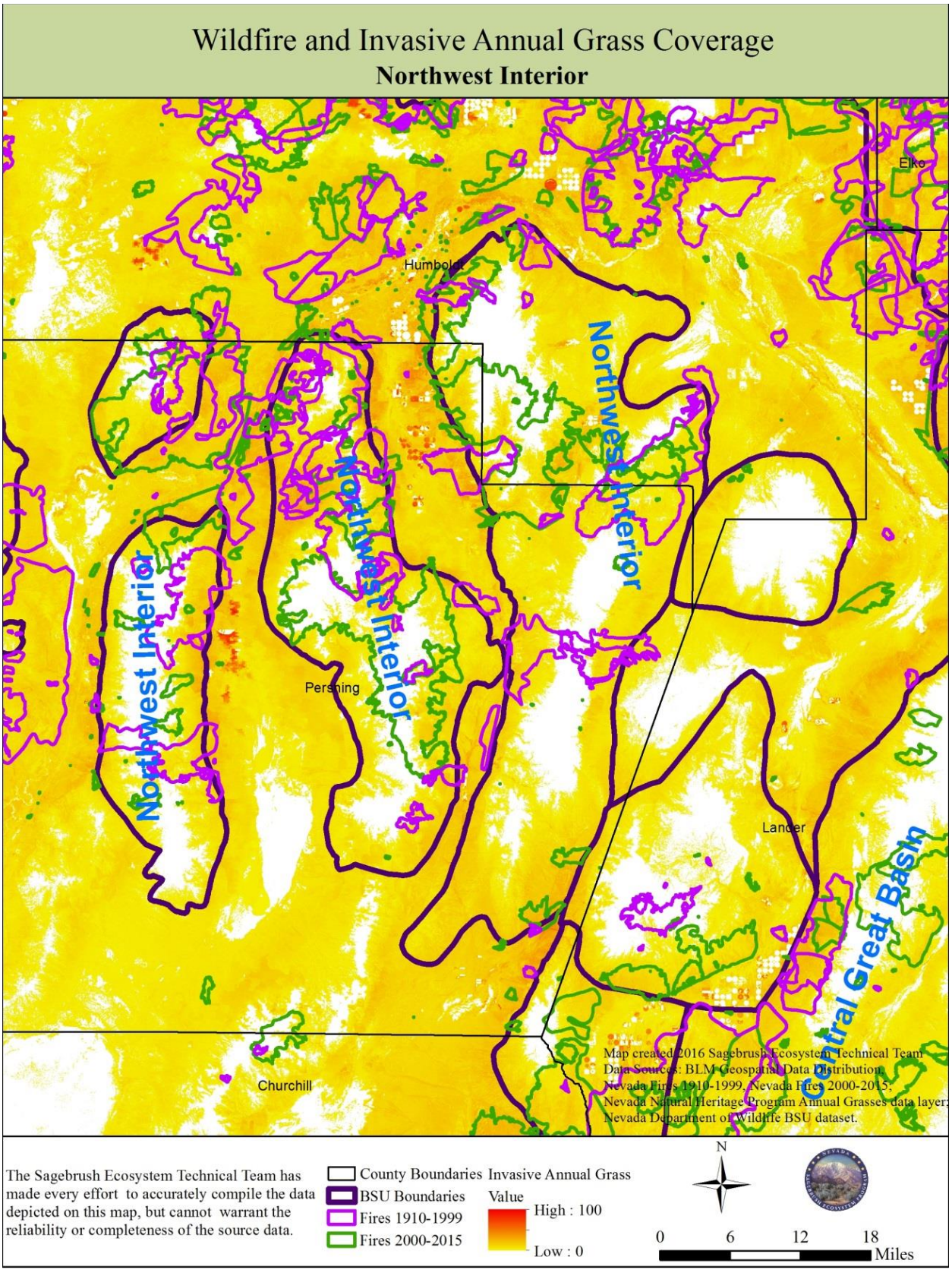
Appendix B. Wildfire and Annual Grass Coverage by BSU

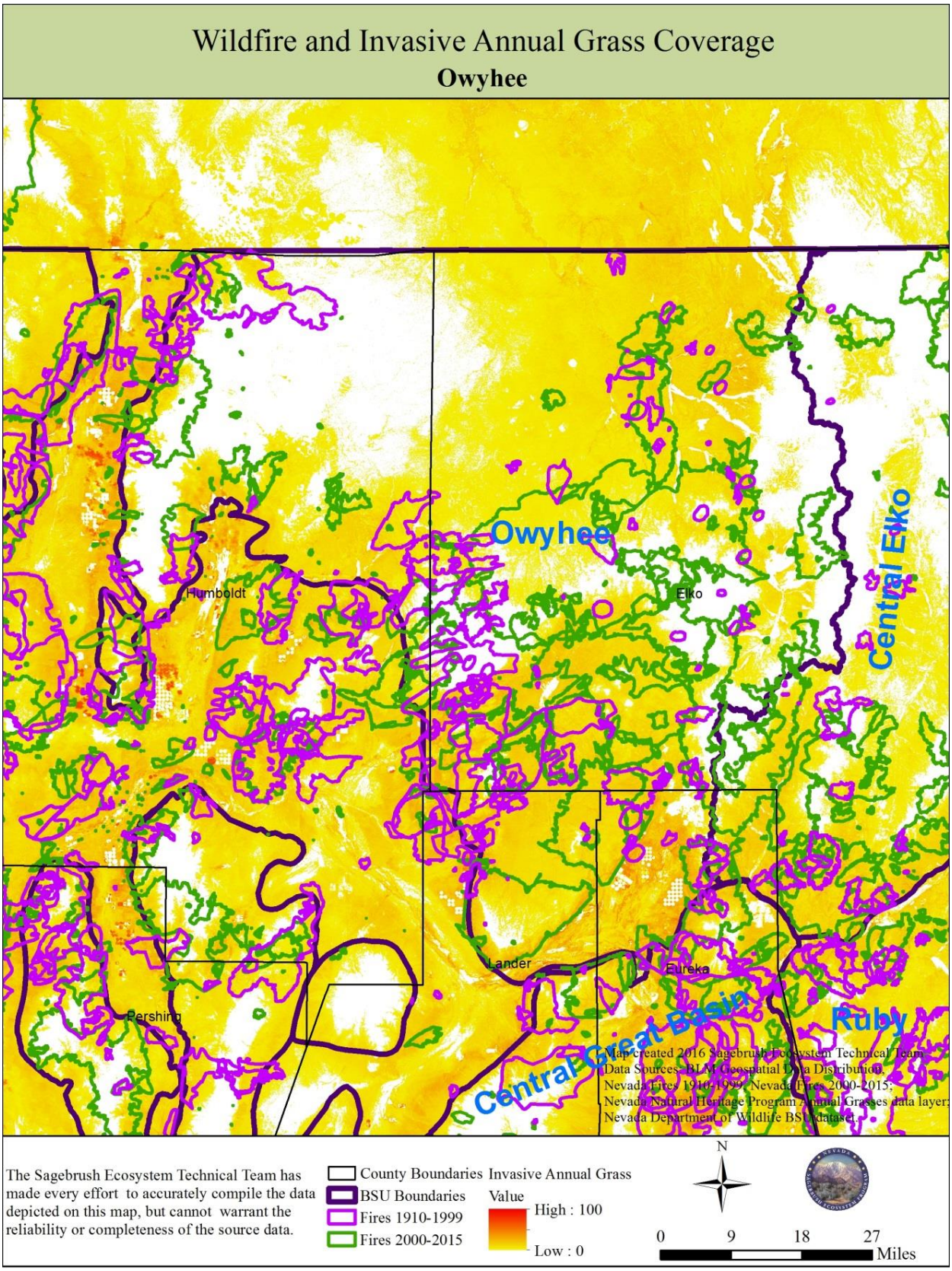


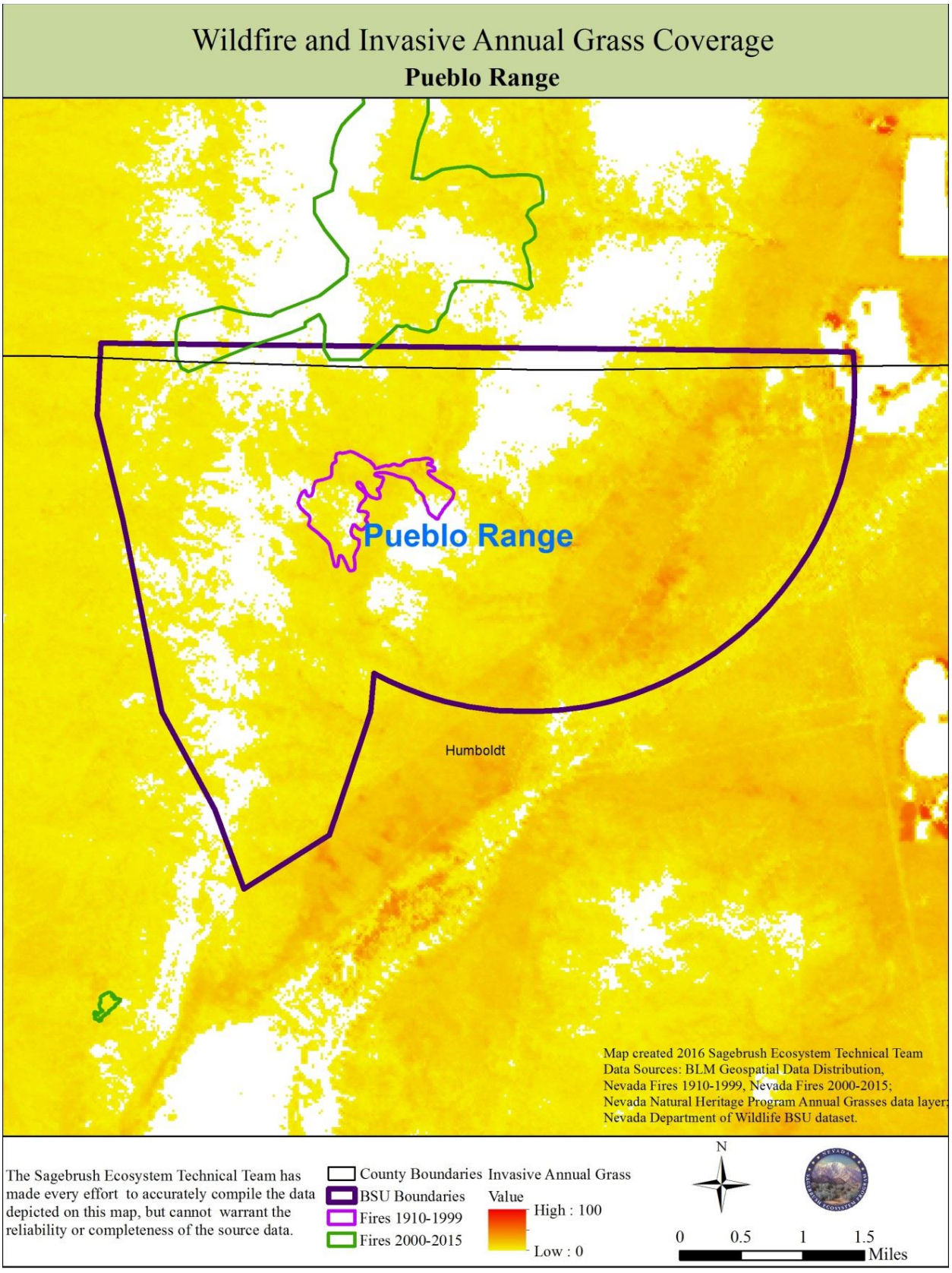

Wildfire and Invasive Annual Grass Coverage
Lassen/South Washoe
Lassen/South Washoe
Humboldt
Washoe
Pershing
Churchill
Lyon
Storey
Map created 2016 Sagebrush Ecosystem Technical Team
Data Source: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 9 18 27
Miles

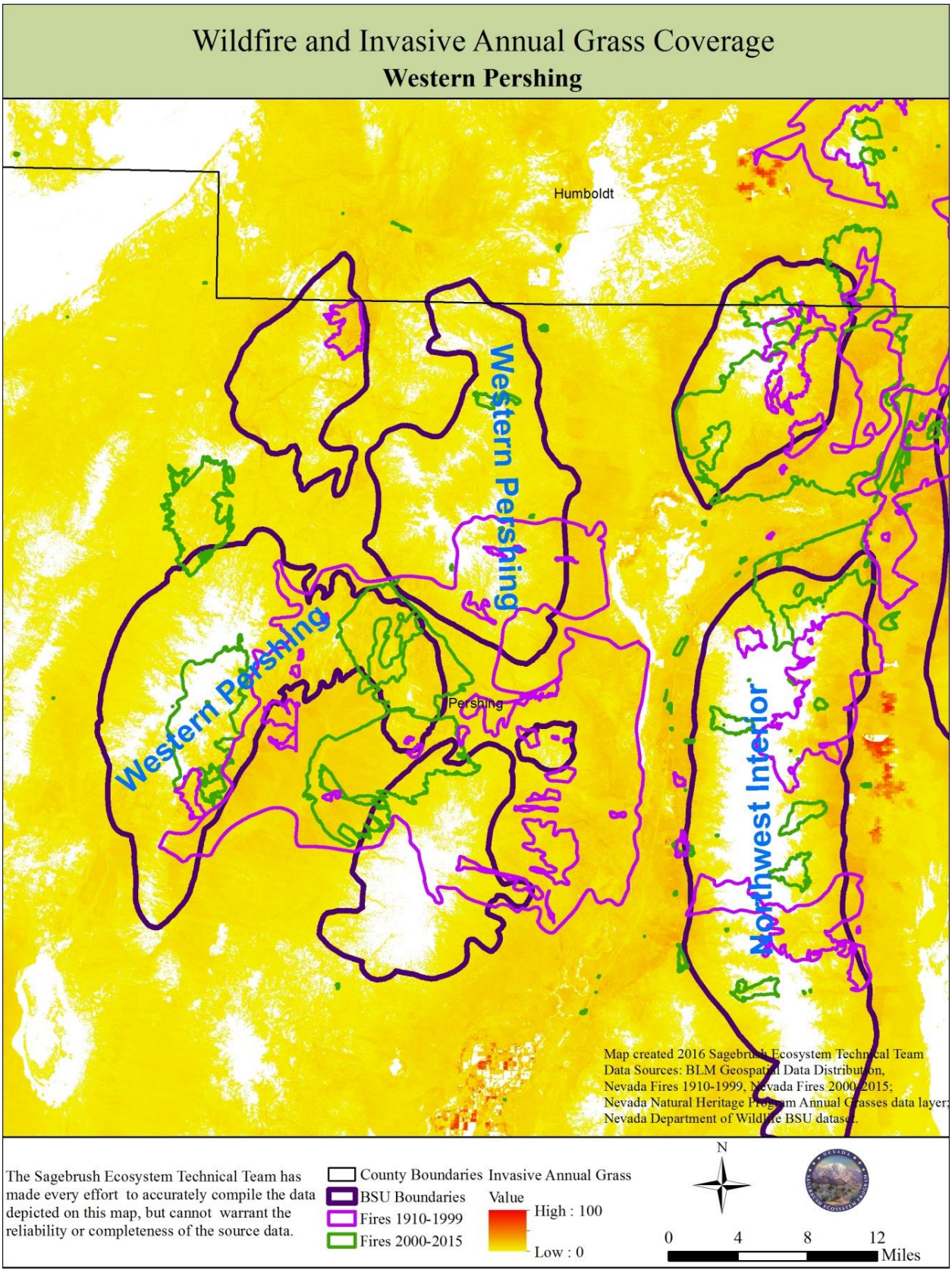

Wildfire and Invasive Annual Grass Coverage
Black Rock
Northwest Great Basin (NV)
Lone Willow
Black Rock
Humboldt
Black Rock
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999; Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 4 8 12
Miles

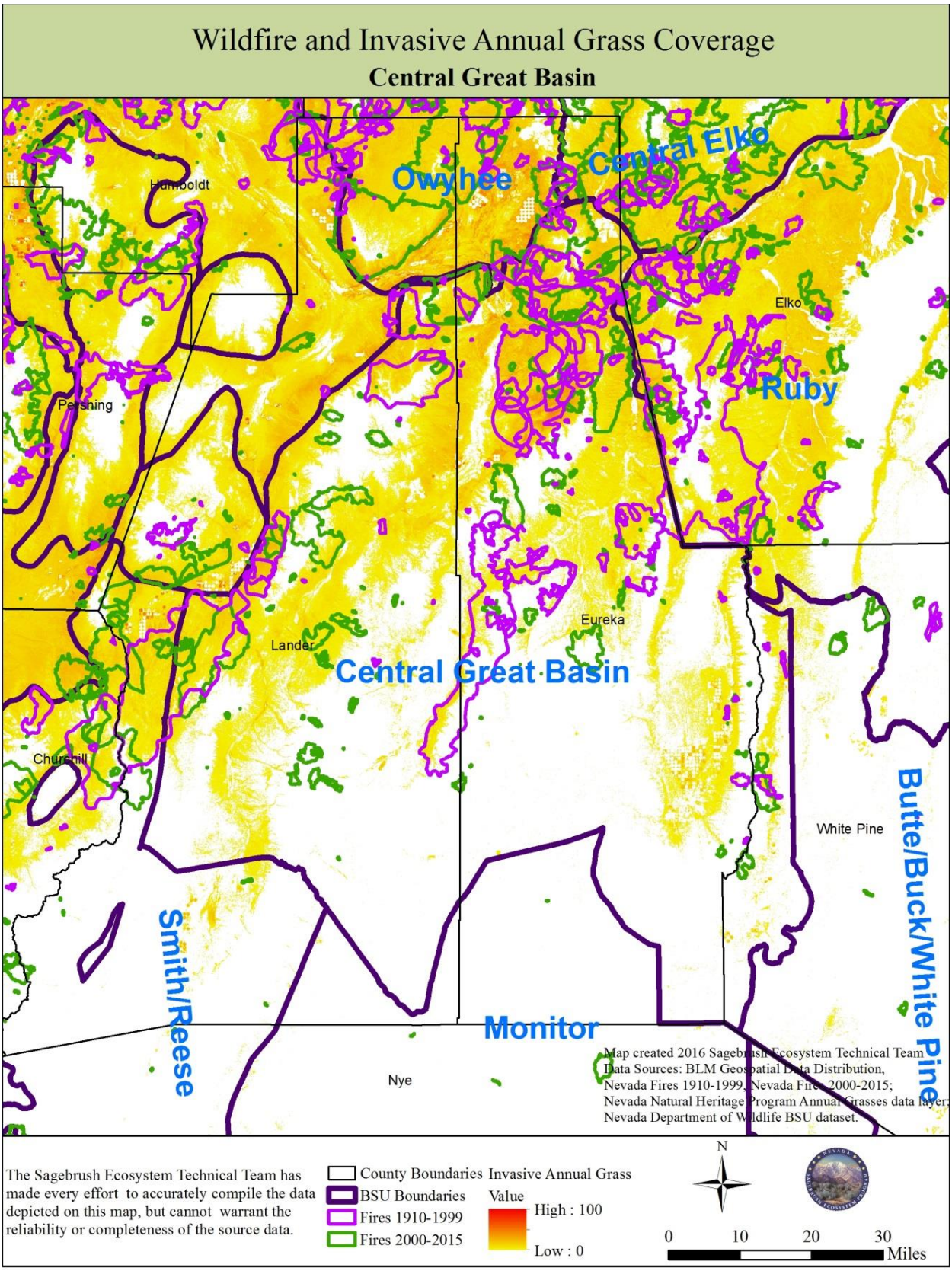

Wildfire and Invasive Annual Grass Coverage
Lone Willow
Lone Willow
Humboldt
Black Rock
Owyhee
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution;
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 4 8 12
Miles

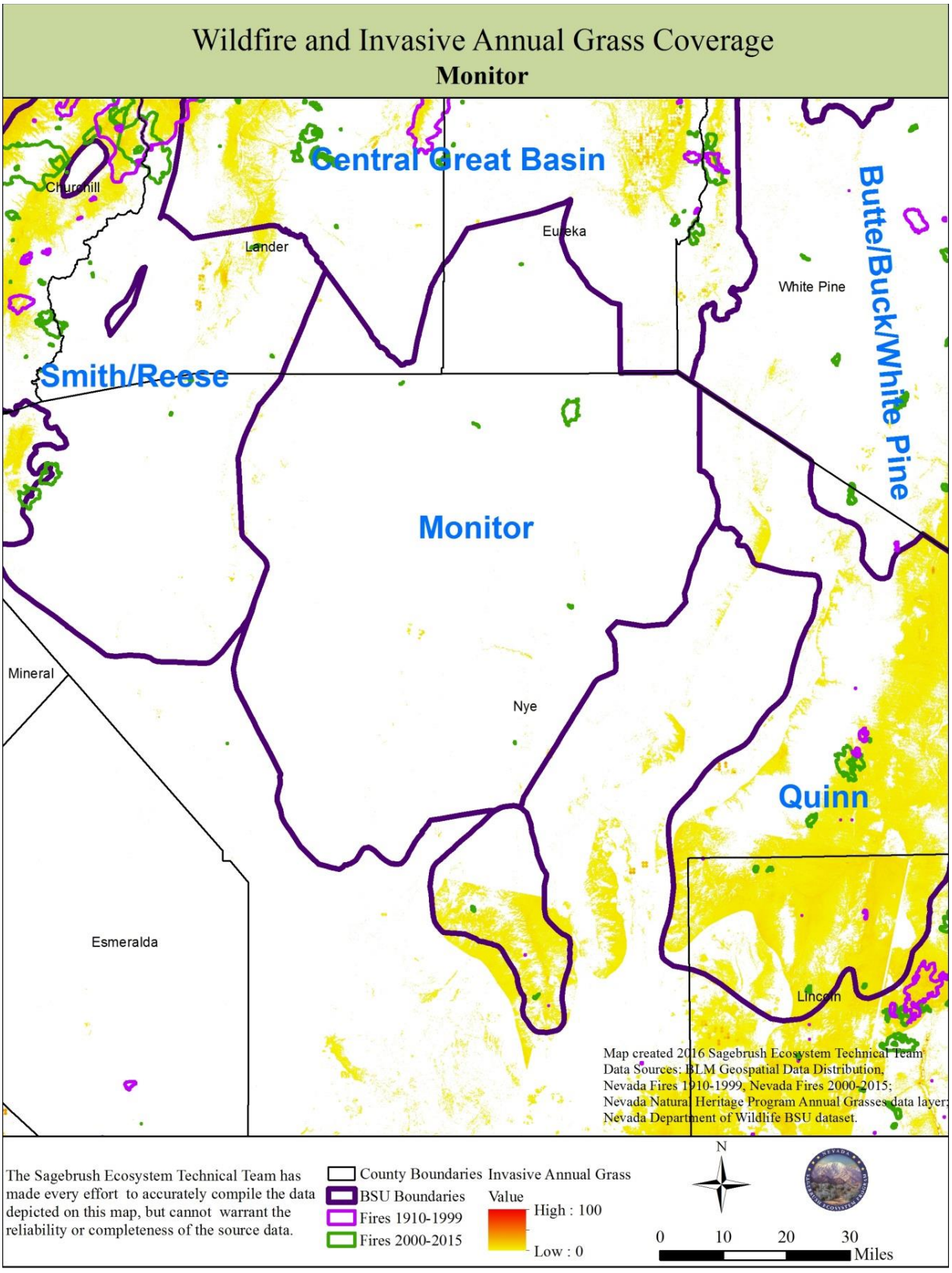

Wildfire and Invasive Annual Grass Coverage
Northwest Interior
Elko
Humboldt
Northwest Interior
Northwest Interior
Northwest Interior
Pershing
Lander
Central Great Basin
Churchill
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 6 12 18
Miles

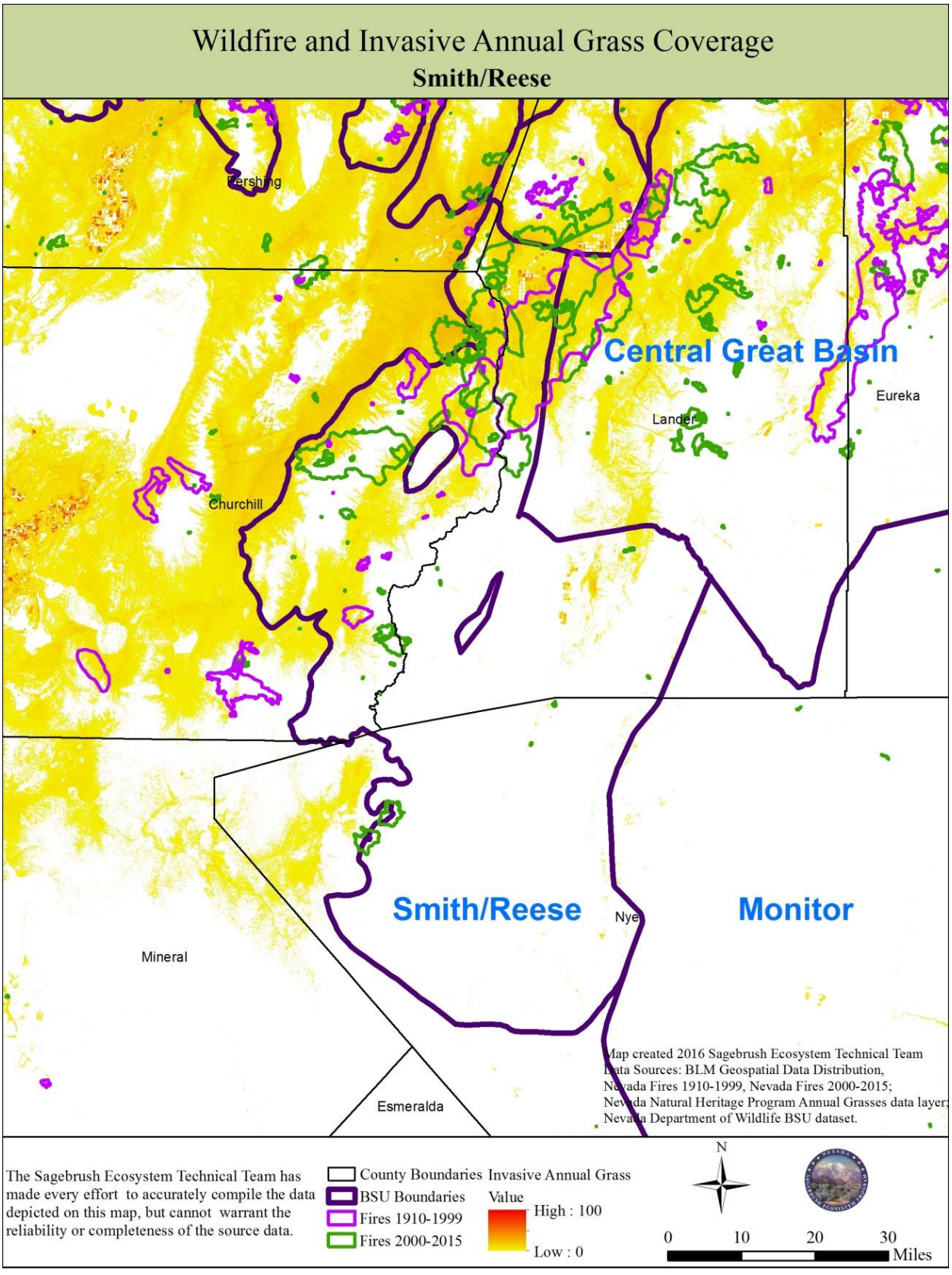

Wildfire and Invasive Annual Grass Coverage
Owyhee
Owyhee
Humboldt
Elko
Central Elko
Lander
Eureka
Pershing
Central Great Basin
Ruby
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015,
Nevada Natural Heritage Program Annual Grasses data layer,
Nevada Department of Wildlife BSU datasets.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 9 18 27
Miles

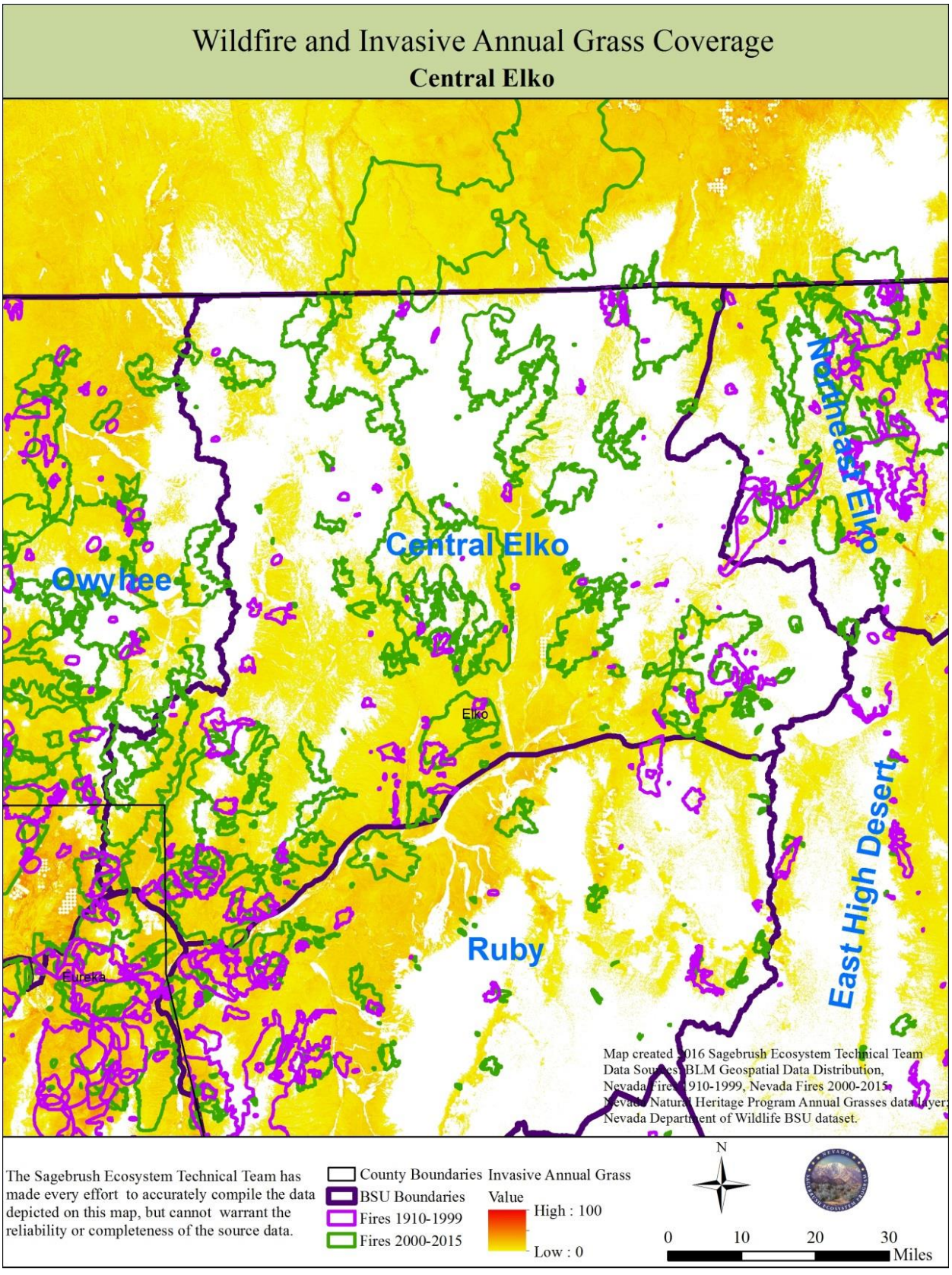

Wildfire and Invasive Annual Grass Coverage
Pueblo Range
Pueblo Range
Humboldt
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0
0.5
1
1.5
Miles

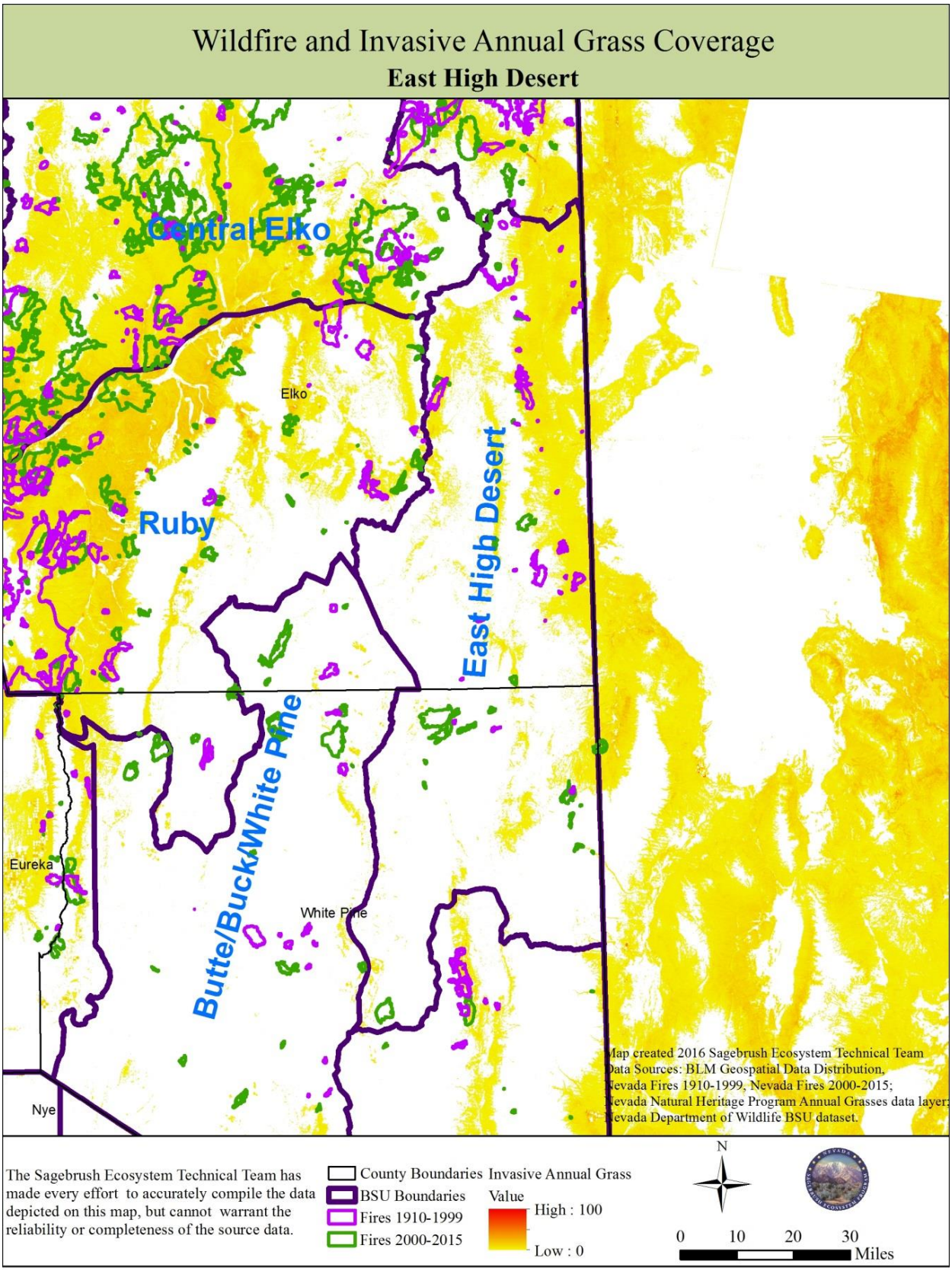

Wildfire and Invasive Annual Grass Coverage
Western Pershing
Humboldt
Western Pershing
Western Pershing
Pershing
Northwest Interior
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 4 8 12
Miles

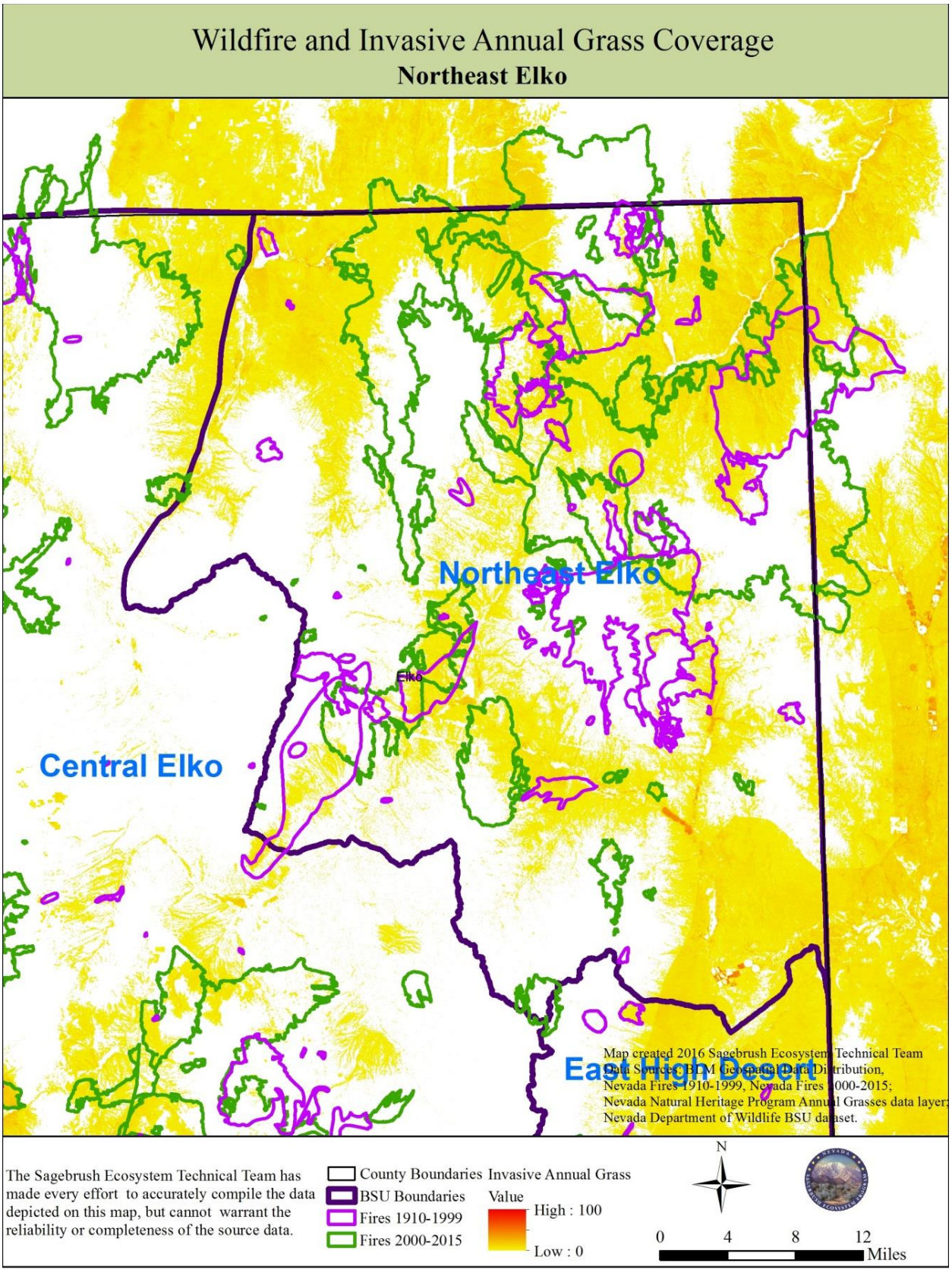

Wildfire and Invasive Annual Grass Coverage
Central Great Basin
Humboldt
Owyhee
Central Elko
Elko
Ruby
Pershing
Eureka
Lander
Central Great Basin
Churchill
White Pine
Butte/Buck/White Pine
Smith/Reese
Monitor
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles

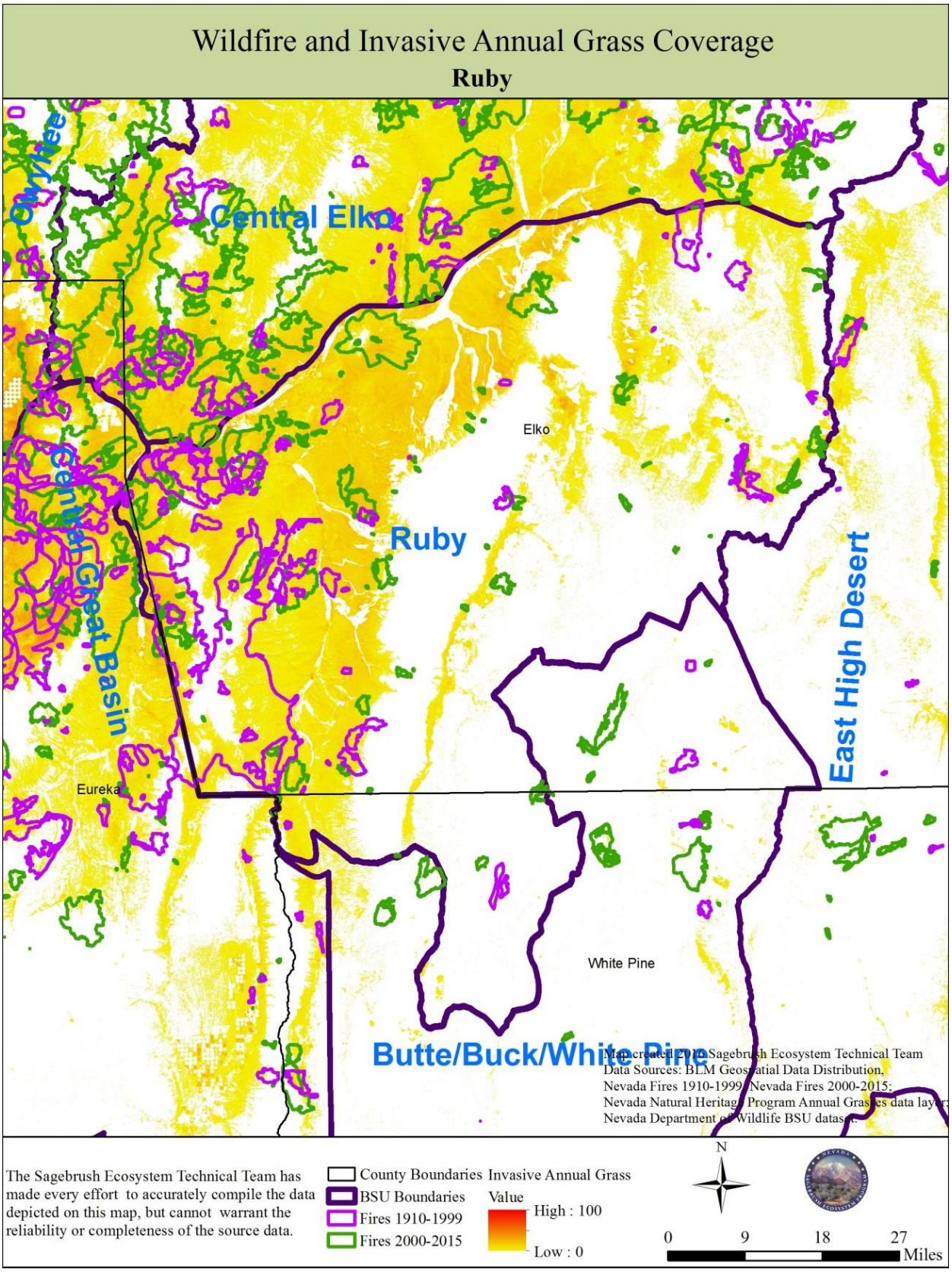

Wildfire and Invasive Annual Grass Coverage
Monitor
Central Great Basin
Churchill
Lander
Eureka
White Pine
Butte/Buck/White Pine
Smith/Reese
Monitor
Mineral
Nye
Quinn
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles

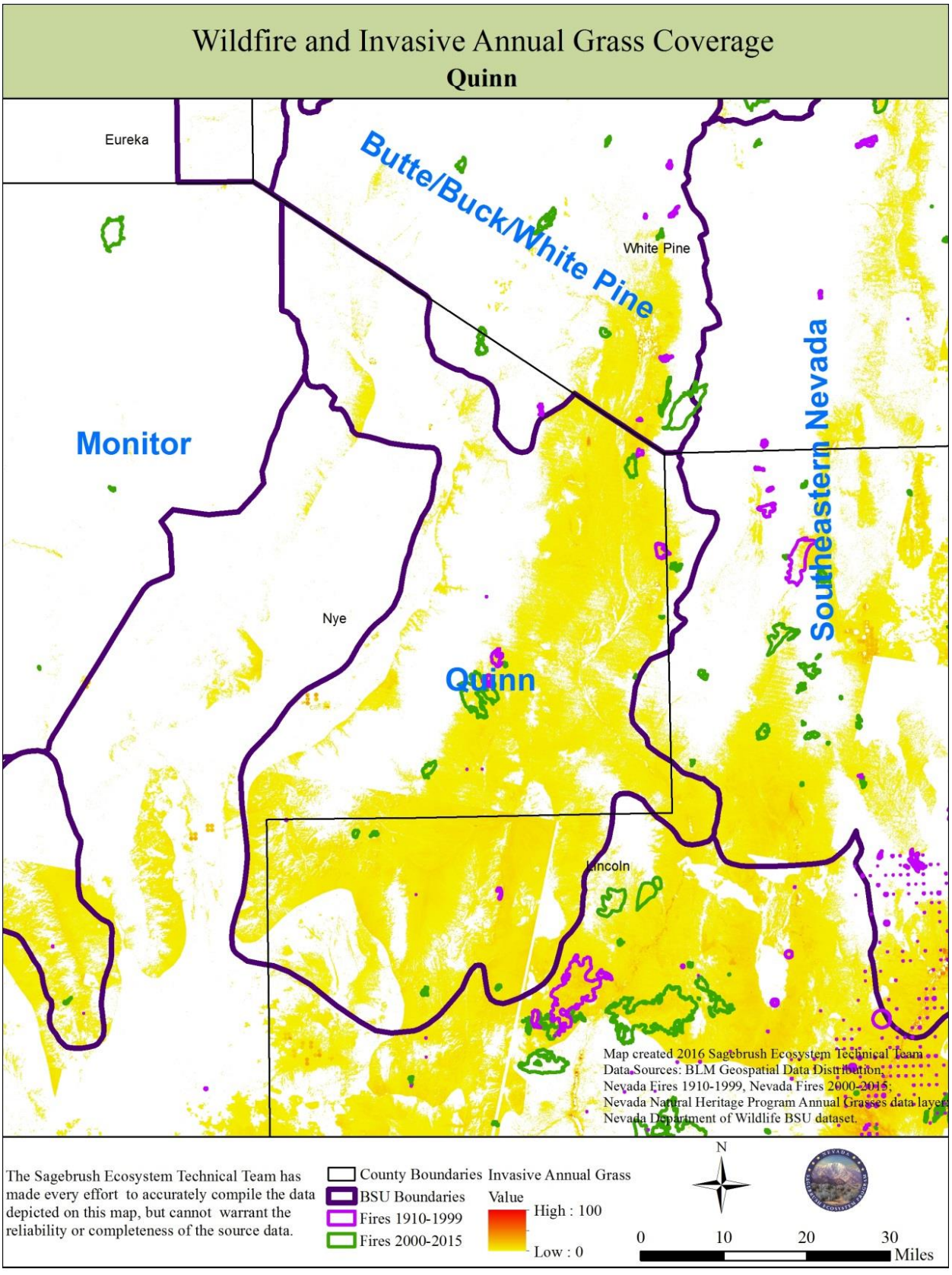

Wildfire and Invasive Annual Grass Coverage
Smith/Reese
Pershing
Central Great Basin
Eureka
Lander
Churchill
Smith/Reese
Nye
Monitor
Mineral
Esmeralda
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles

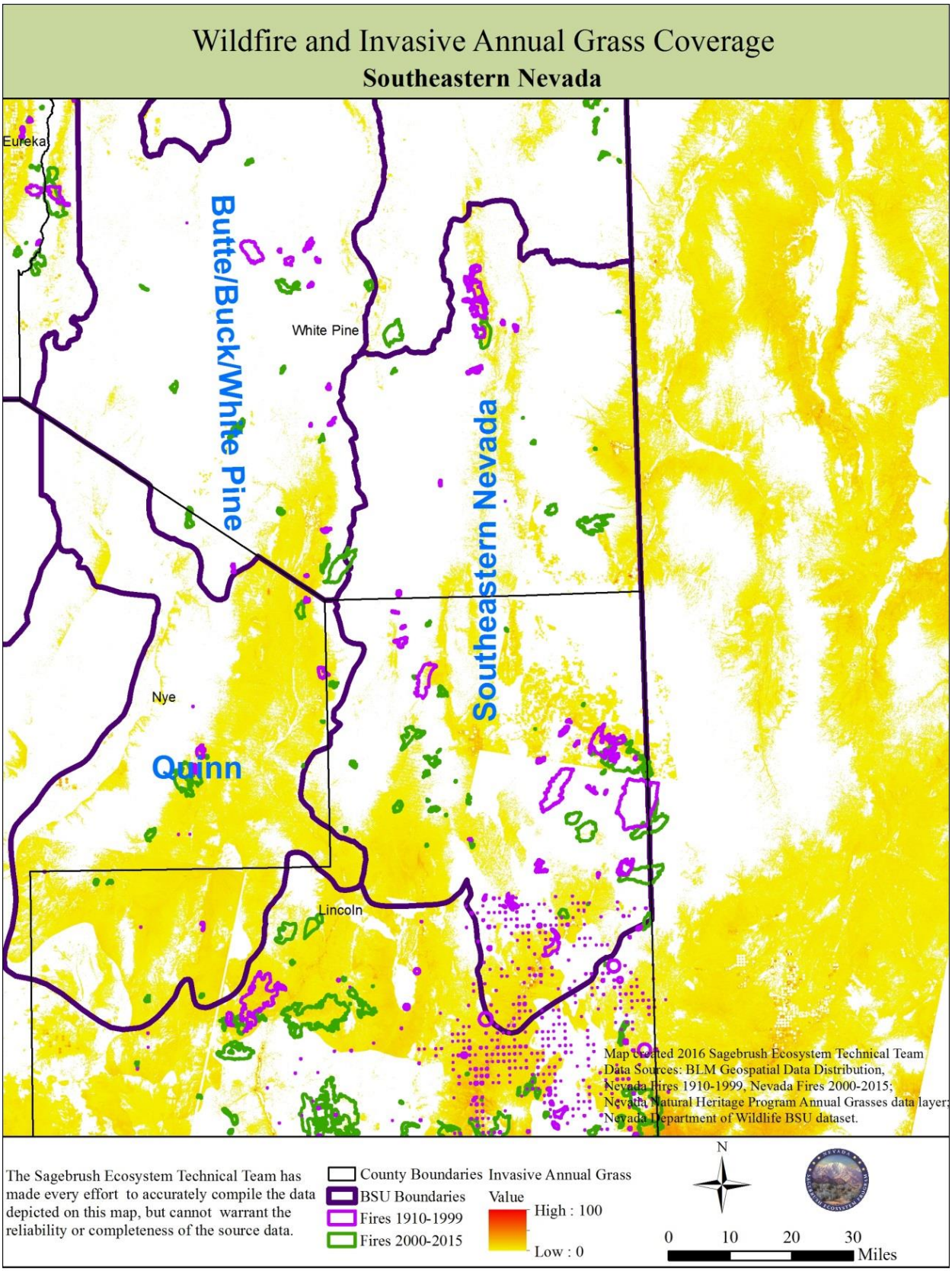

Wildfire and Invasive Annual Grass Coverage
Central Elko
Owyhee
Central Elko
Northeast Elko
East High Desert
Ruby
Elko
Eureka
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015,
Nevada Natural Heritage Program Annual Grasses data layer,
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles

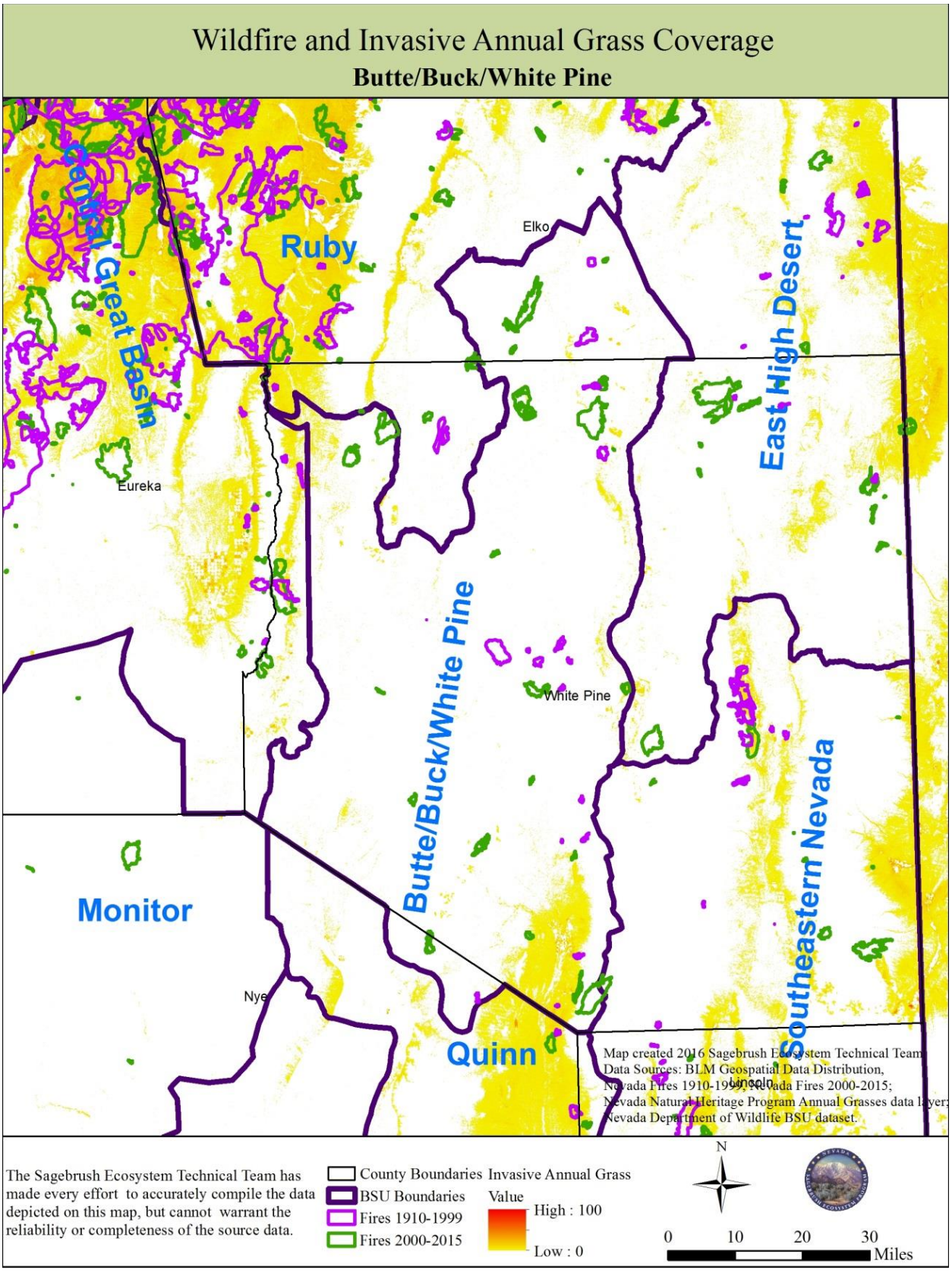

Wildfire and Invasive Annual Grass Coverage
East High Desert
Central Elko
Elko
Ruby
East High Desert
Butte/Buck/White Pine
White Pine
Eureka
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles


Wildfire and Invasive Annual Grass Coverage
Northeast Elko
Northeast Elko
Elko
Central Elko
East High Desert
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 4 8 12
Miles


Wildfire and Invasive Annual Grass Coverage
Ruby
Owyhee
Central Elko
Elko
Ruby
Great Basin
East High Desert
Eureka
White Pine
Butte/Buck/White Pine
Map created by Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU datasets
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 9 18 27
Miles


Wildfire and Invasive Annual Grass Coverage
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Southeastern Nevada
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution;
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0
10
20
30
Miles


Wildfire and Invasive Annual Grass Coverage
Southeastern Nevada
Eureka
Butte/Buck/White Pine
White Pine
Southeastern Nevada
Nye
Quinn
Lincoln
Map Created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999, Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles


Wildfire and Invasive Annual Grass Coverage
Butte/Buck/White Pine
Central Great Basin
Ruby
Elko
East High Desert
Eureka
Butte/Buck/White Pine
White Pine
Southeastern Nevada
Monitor
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution,
Nevada Fires 1910-1999; Nevada Fires 2000-2015;
Nevada Natural Heritage Program Annual Grasses data layer;
Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Fires 1910-1999
Fires 2000-2015
Invasive Annual Grass
Value
High : 100
Low : 0
N
0 10 20 30
Miles

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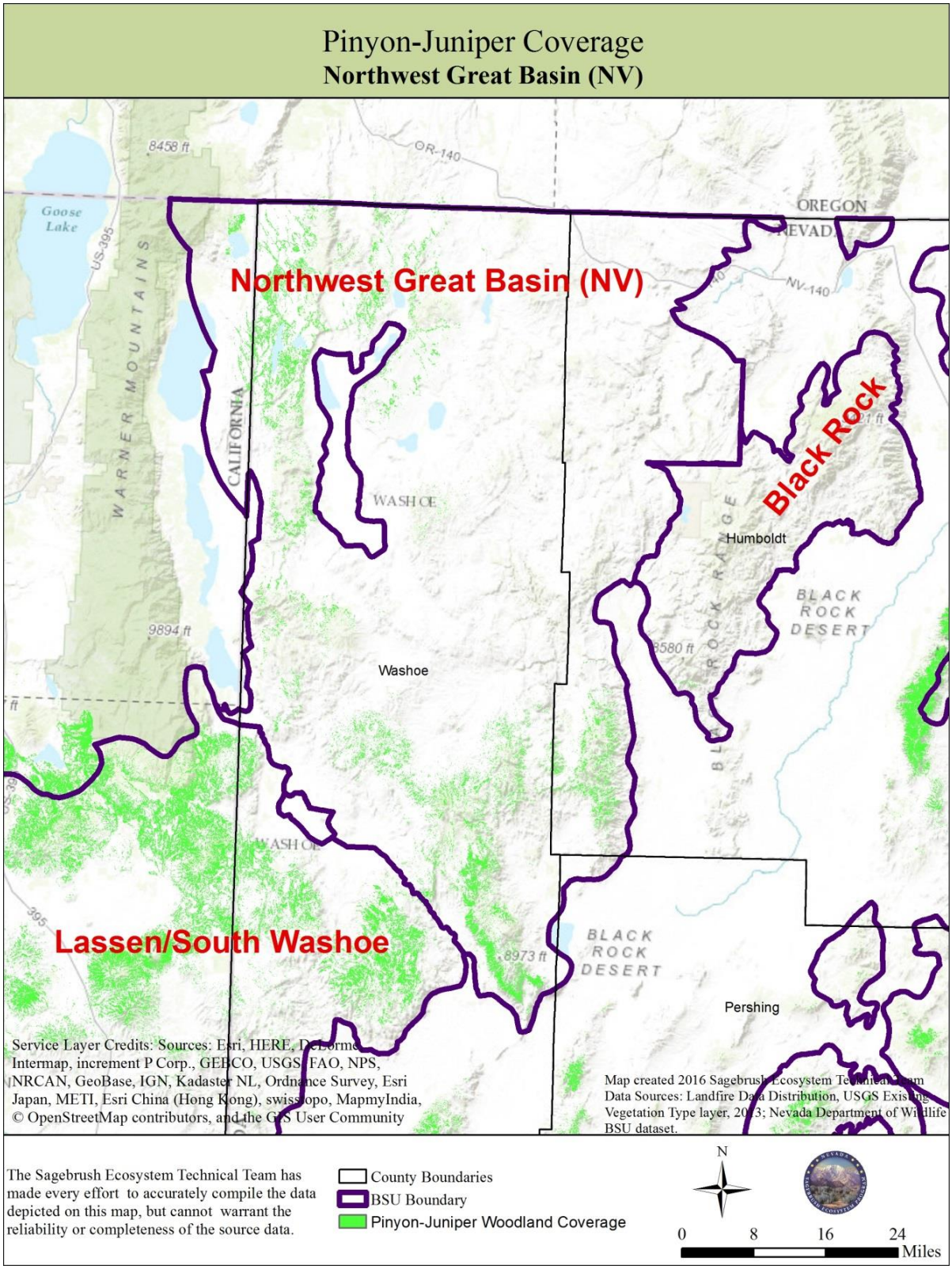
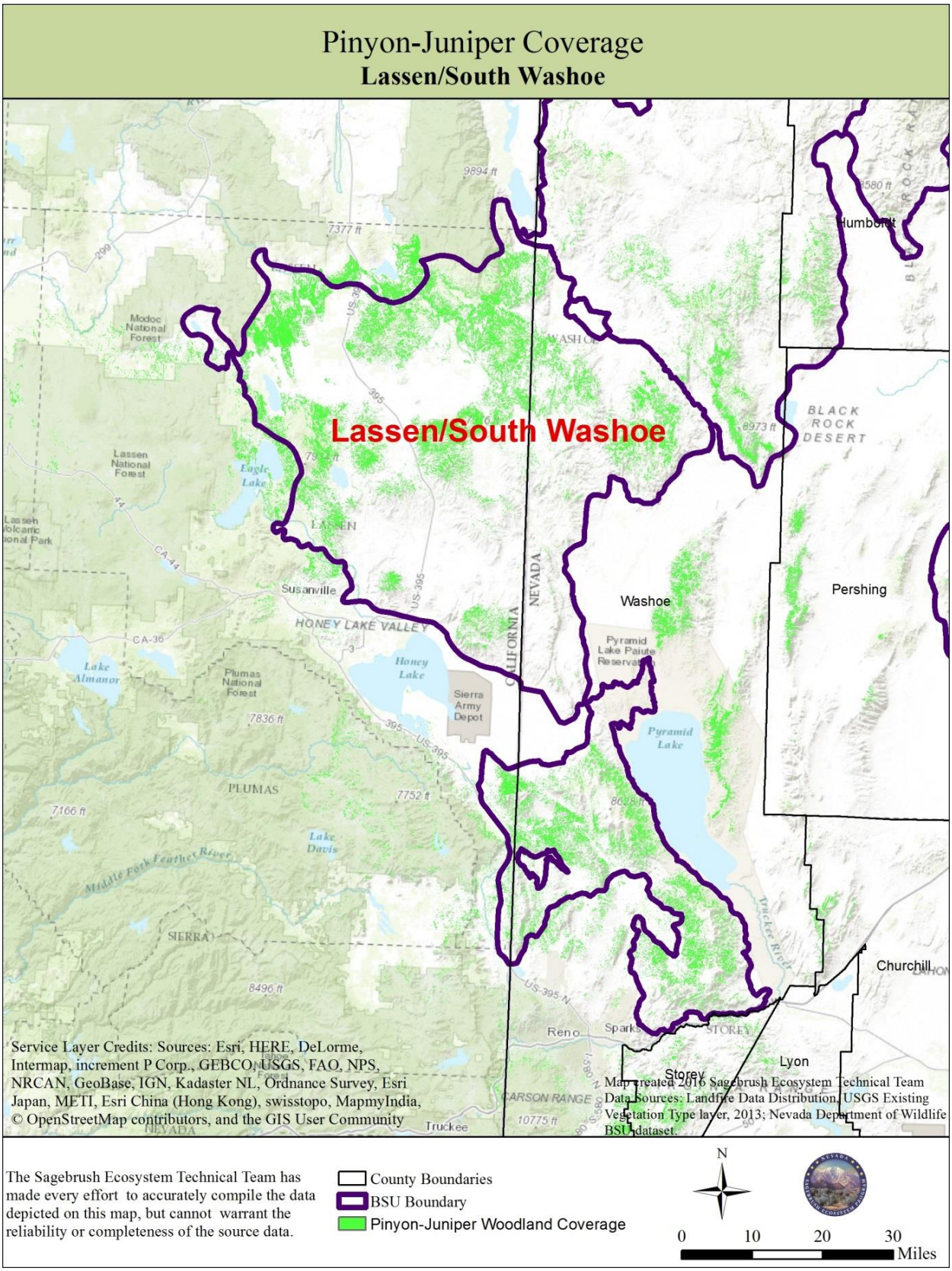
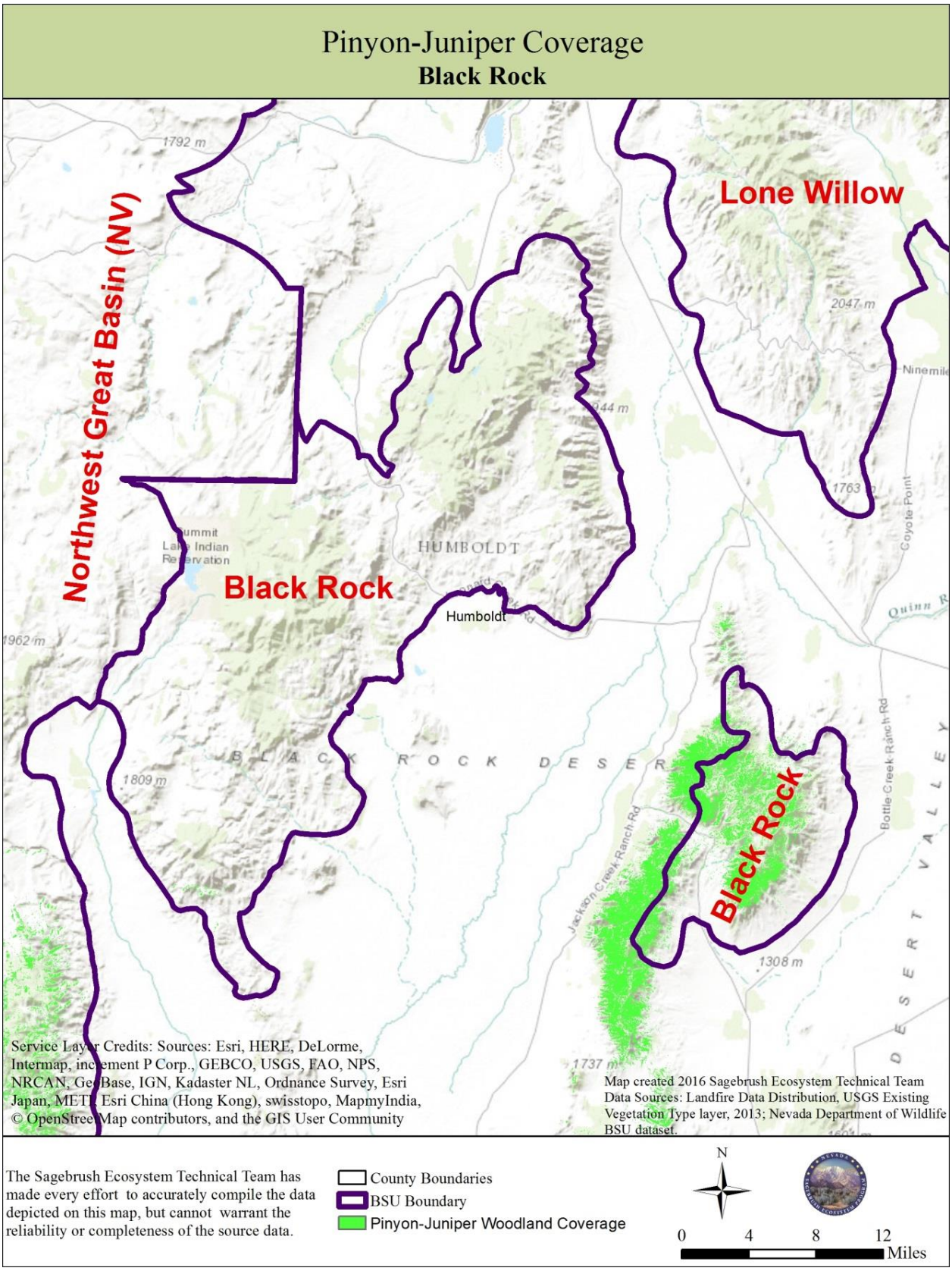
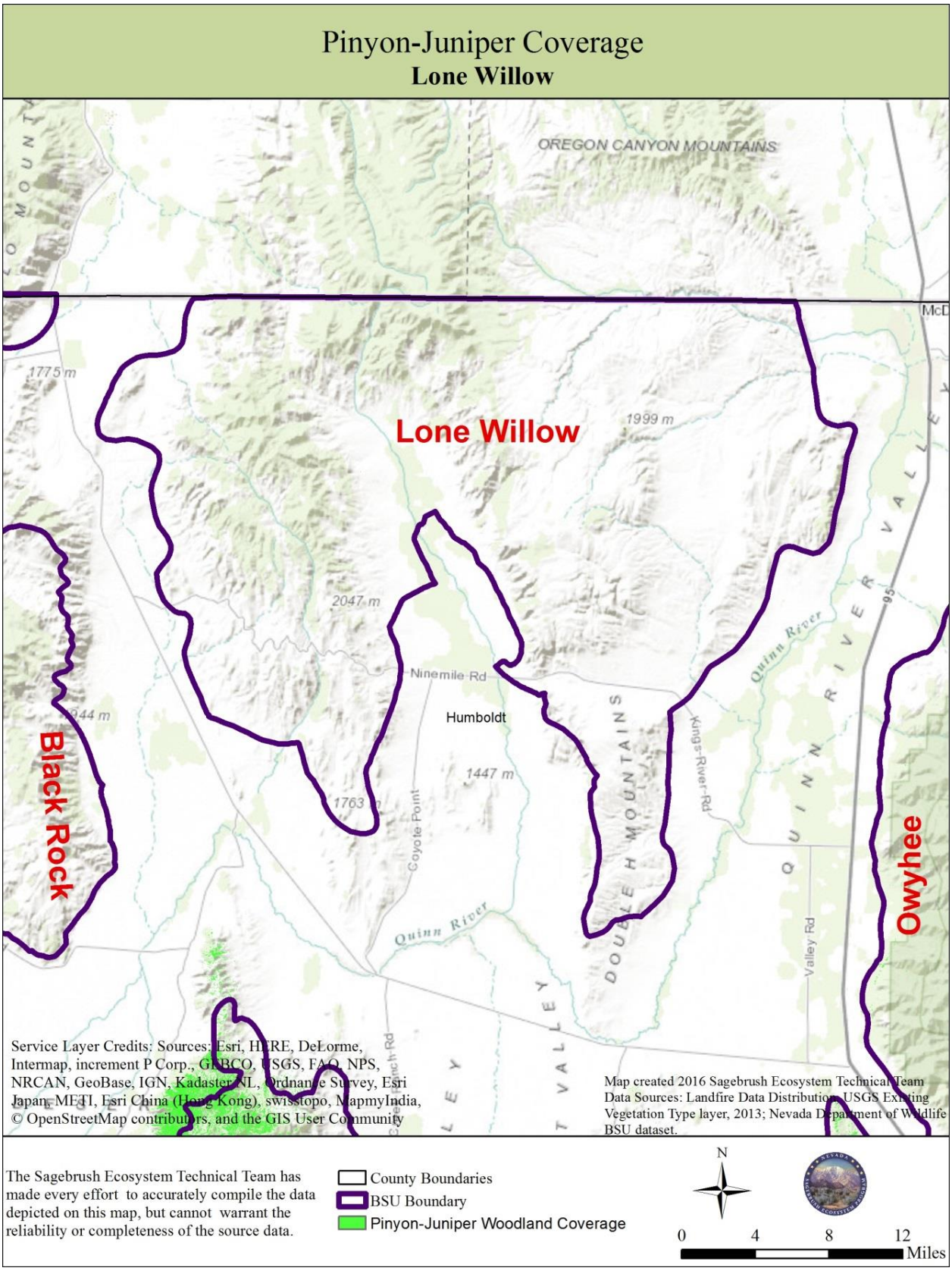
Appendix C. Pinyon-Juniper Coverage by BSU

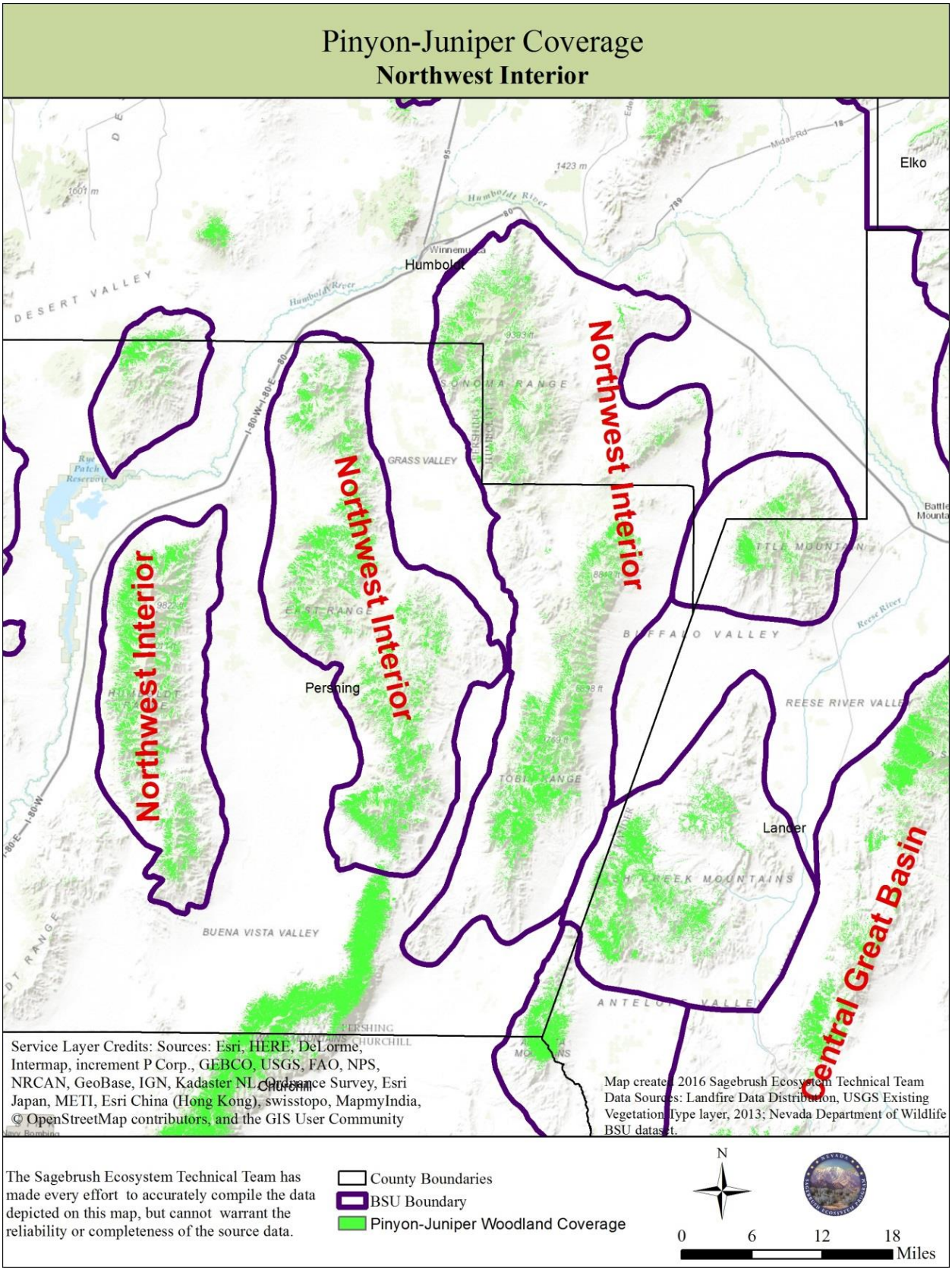



Pinyon-Juniper Coverage
Lassen/South Washoe
Lassen/South Washoe
Modoc National Forest
Lassen National Forest
Plumas National Forest
Susanville
HONEY LAKE VALLEY
Honey Lake
Lake Almanor
Eagle Lake
Sierra Army Depot
Pyramid Lake Paiute Reservation
Pyramid Lake
Lake Davis
Middle Fork Feather River
PLUMAS
SIERRA
LASSEN
CALIFORNIA
NEVADA
WASHOE
Washoe
Pershing
Humboldt
BLACK ROCK DESERT
Churchill
Lyon
Storey
Reno
Sparks
STOREY
CARSON RANGE
Truckee
US-395
CA-44
CA-36
9894 ft
7377 ft
7836 ft
7752 ft
7166 ft
8496 ft
10775 ft
8973 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles

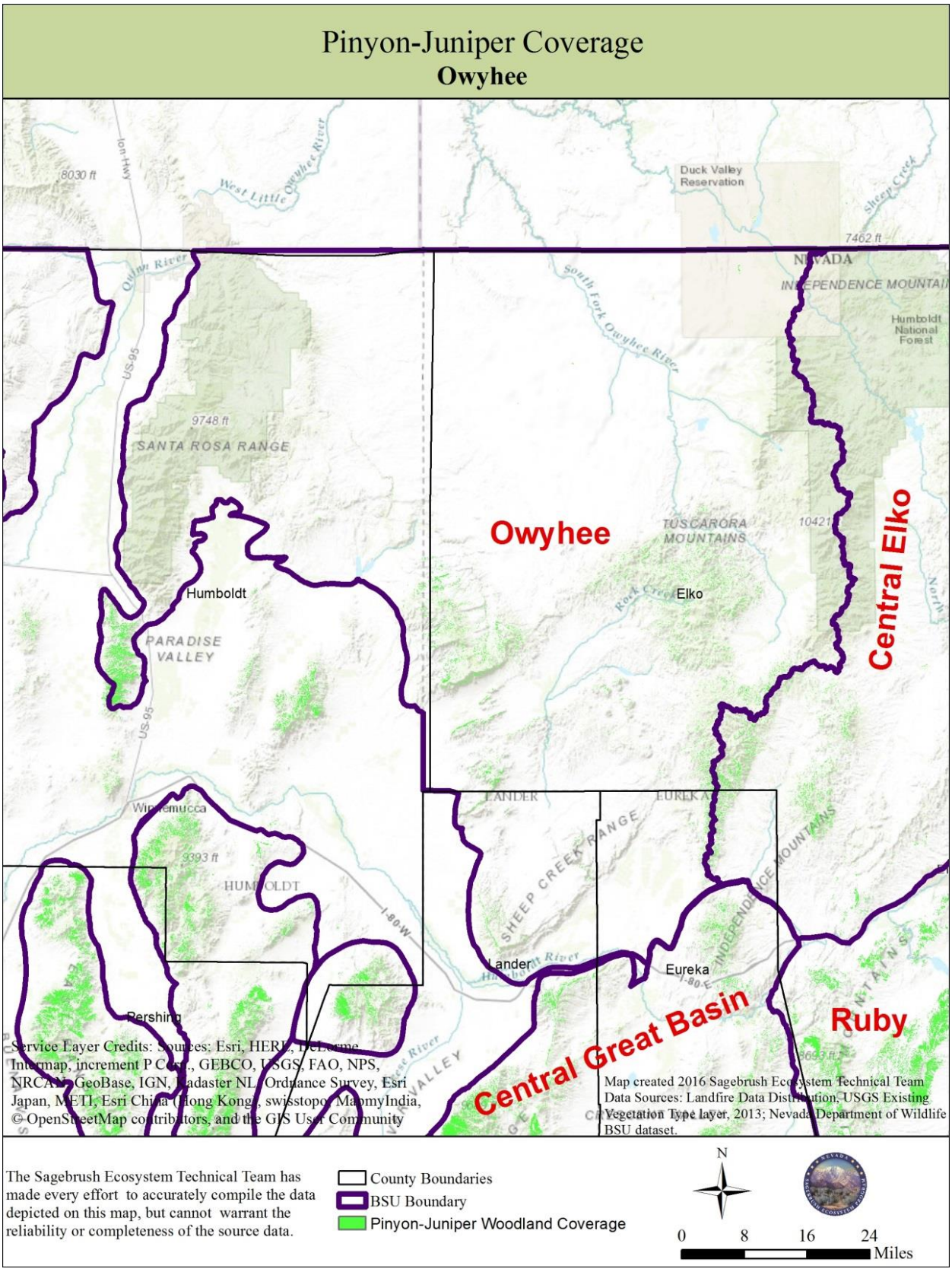

Pinyon-Juniper Coverage
Black Rock
Northwest Great Basin (NV)
Lone Willow
Black Rock
Black Rock
1792 m
2047 m
1763
1962 m
1809 m
1308 m
1737 m
HUMBOLDT
Humboldt
Ninemile
Coyote Point
Quinn R
Bottle Creek Ranch Rd
Jackson Creek Ranch Rd
B L A C K R O C K D E S E R
D E S E R T V A L L E Y
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 4 8 12
Miles

DRAFT

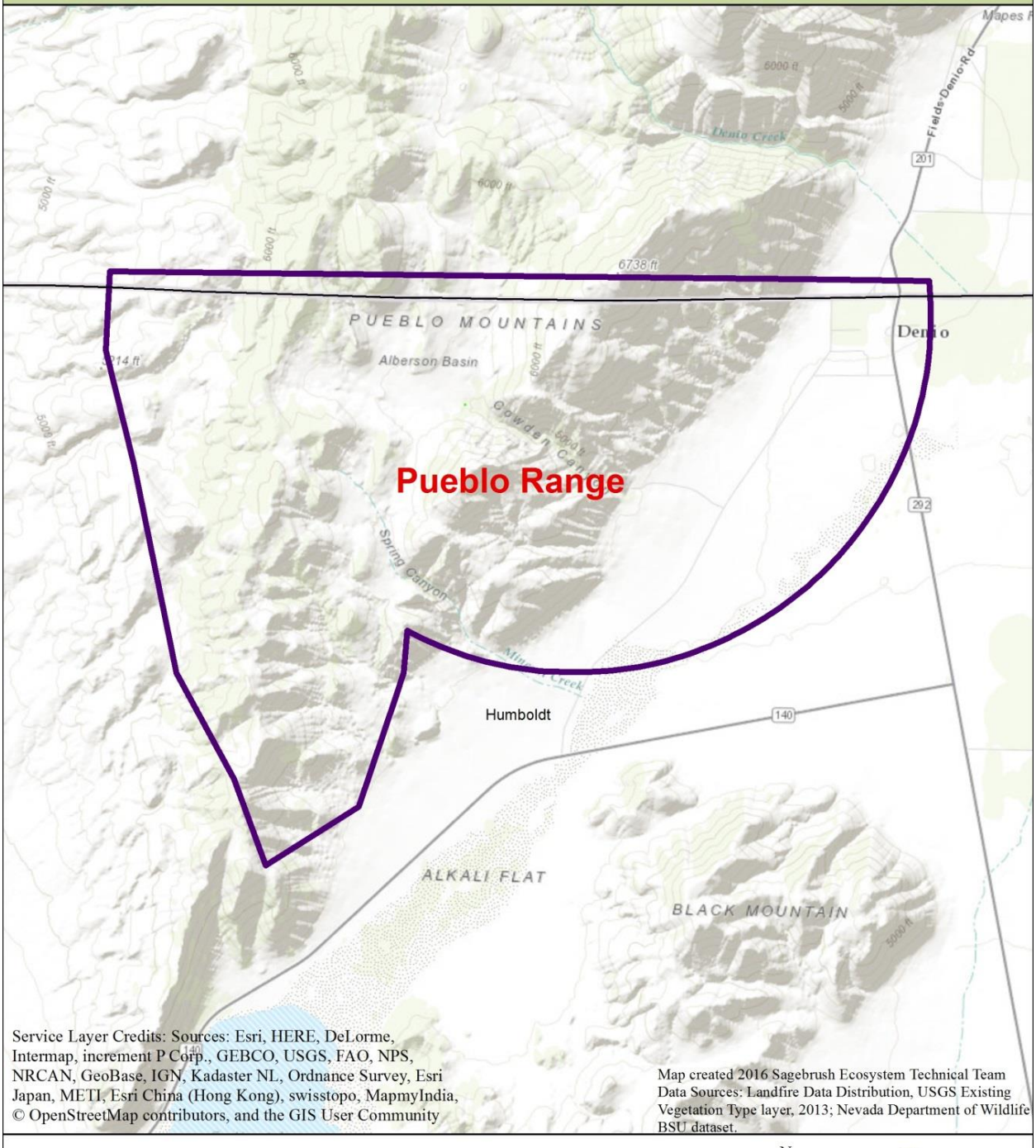

Pinyon-Juniper Coverage
Lone Willow
OREGON CANYON MOUNTAINS
Lone Willow
Black Rock
Owyhee
1775 m
1999 m
2047 m
1447 m
1763 m
Ninemile Rd
Humboldt
Quinn River
Coyote Point
Kings River Rd
Valley Rd
DOUBLE H MOUNTAINS
QUINN RIVER VALLEY
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution; USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 4 8 12
Miles

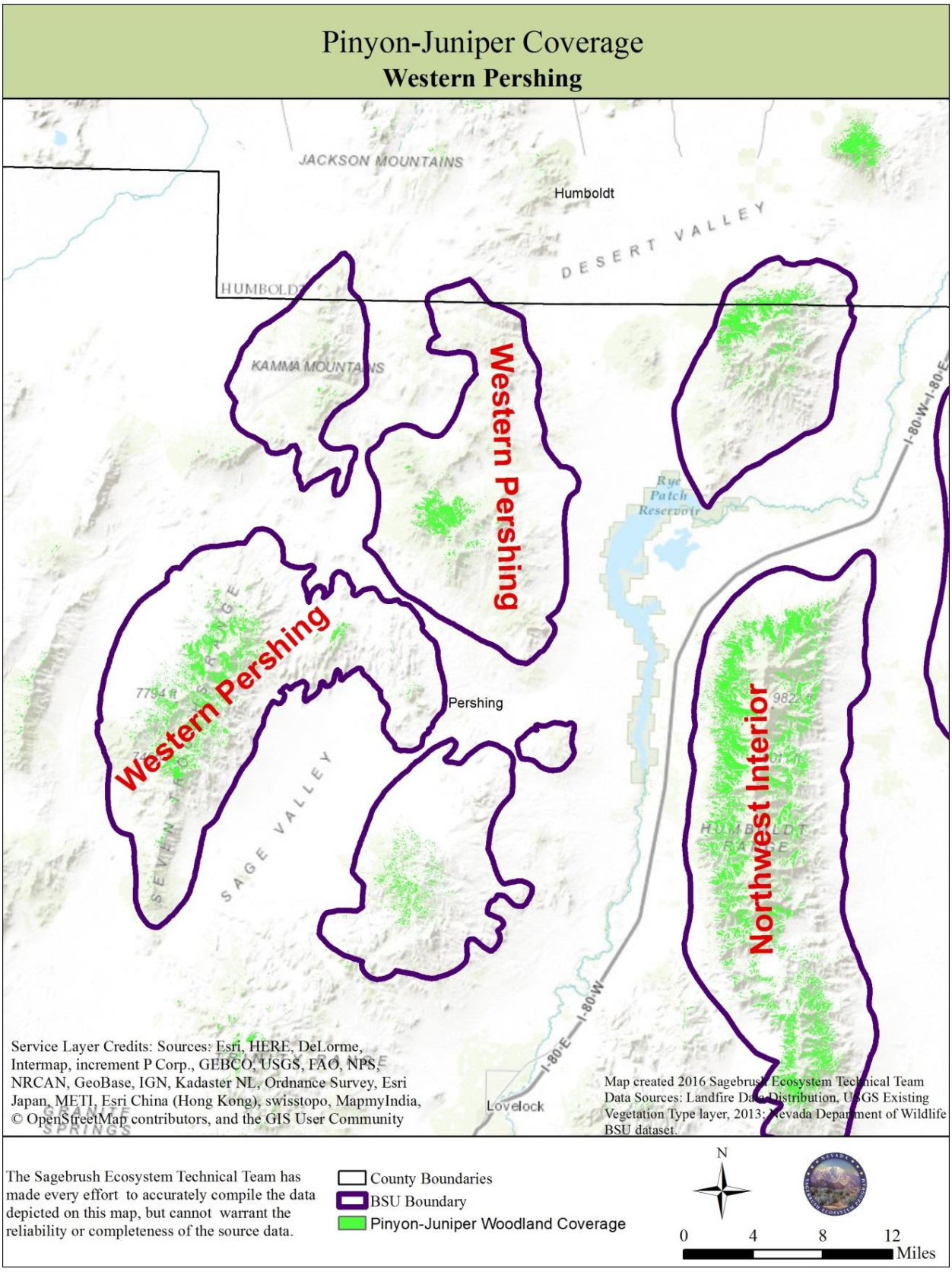

Pinyon-Juniper Coverage
Northwest Interior
Northwest Interior
Northwest Interior
Northwest Interior
Central Great Basin
Elko
Humboldt
Winnemucca
Pershing
Lander
Churchill
DESERT VALLEY
SONOMA RANGE
GRASS VALLEY
BUFFALO VALLEY
REESE RIVER VALLEY
BUENA VISTA VALLEY
TOBIN RANGE
ANTELOPE VALLEY
Humboldt River
Reese River
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 6 12 18
Miles

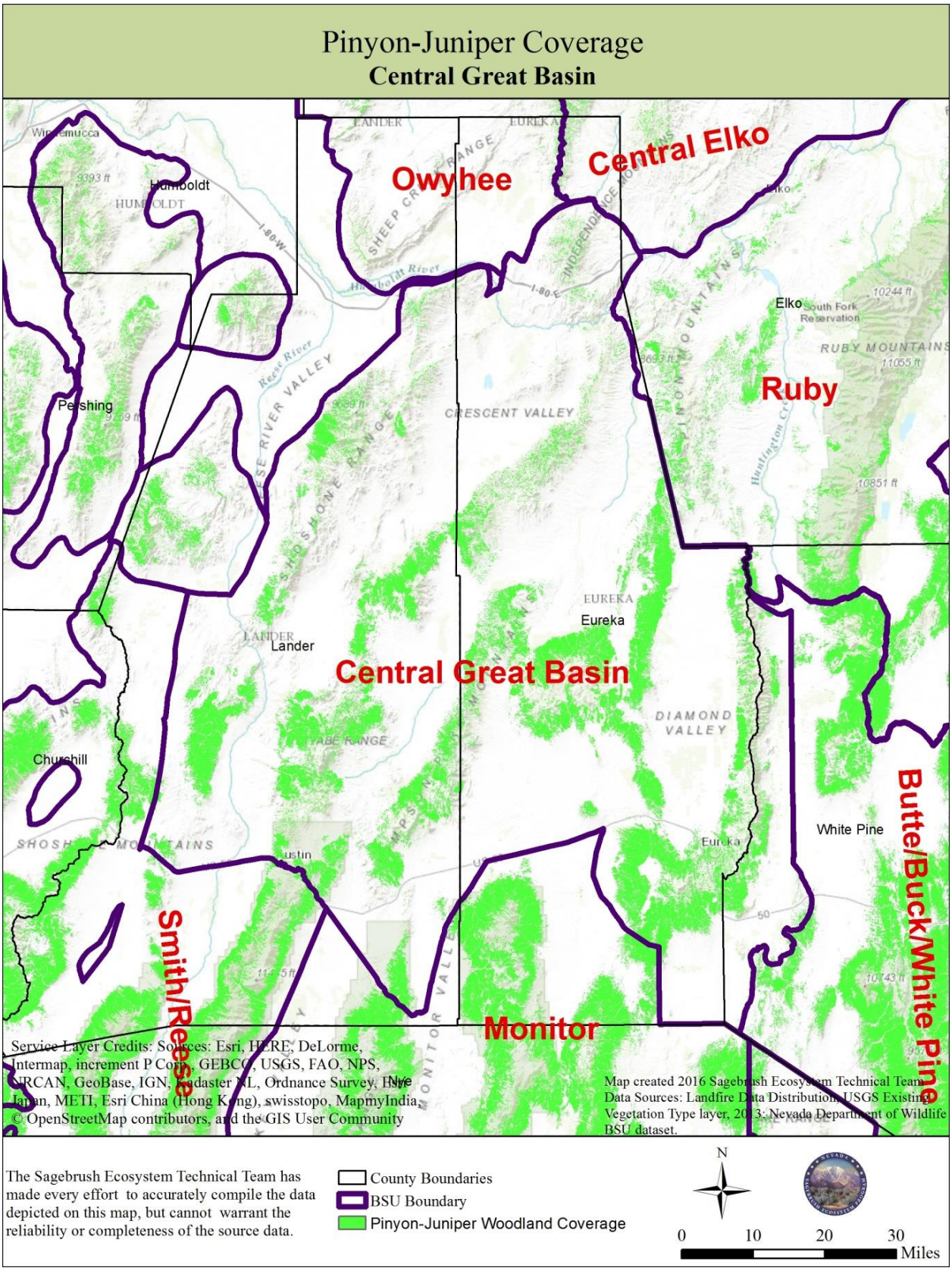
DRAFT

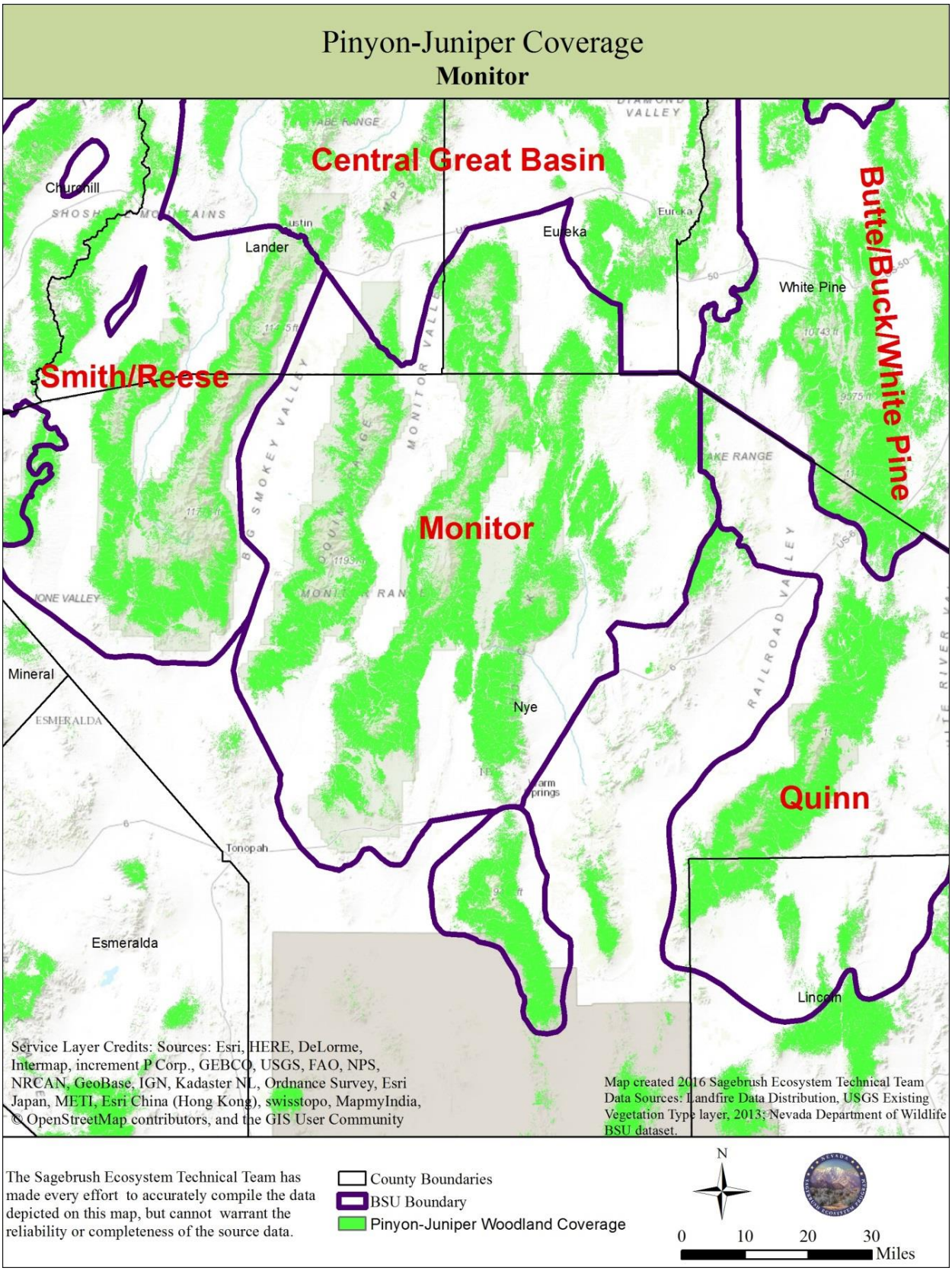

Pinyon-Juniper Coverage
Owyhee
Owyhee
Central Elko
Central Great Basin
Ruby
Humboldt
Elko
Lander
Eureka
Pershing
Winnemucca
Duck Valley Reservation
Humboldt National Forest
SANTA ROSA RANGE
PARADISE VALLEY
TUSCARORA MOUNTAINS
SHEEP CREEK RANGE
INDEPENDENCE MOUNTAINS
HUMBOLDT
LANDER
EUREKA
8030 ft
9748 ft
9393 ft
7462 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 8 16 24
Miles

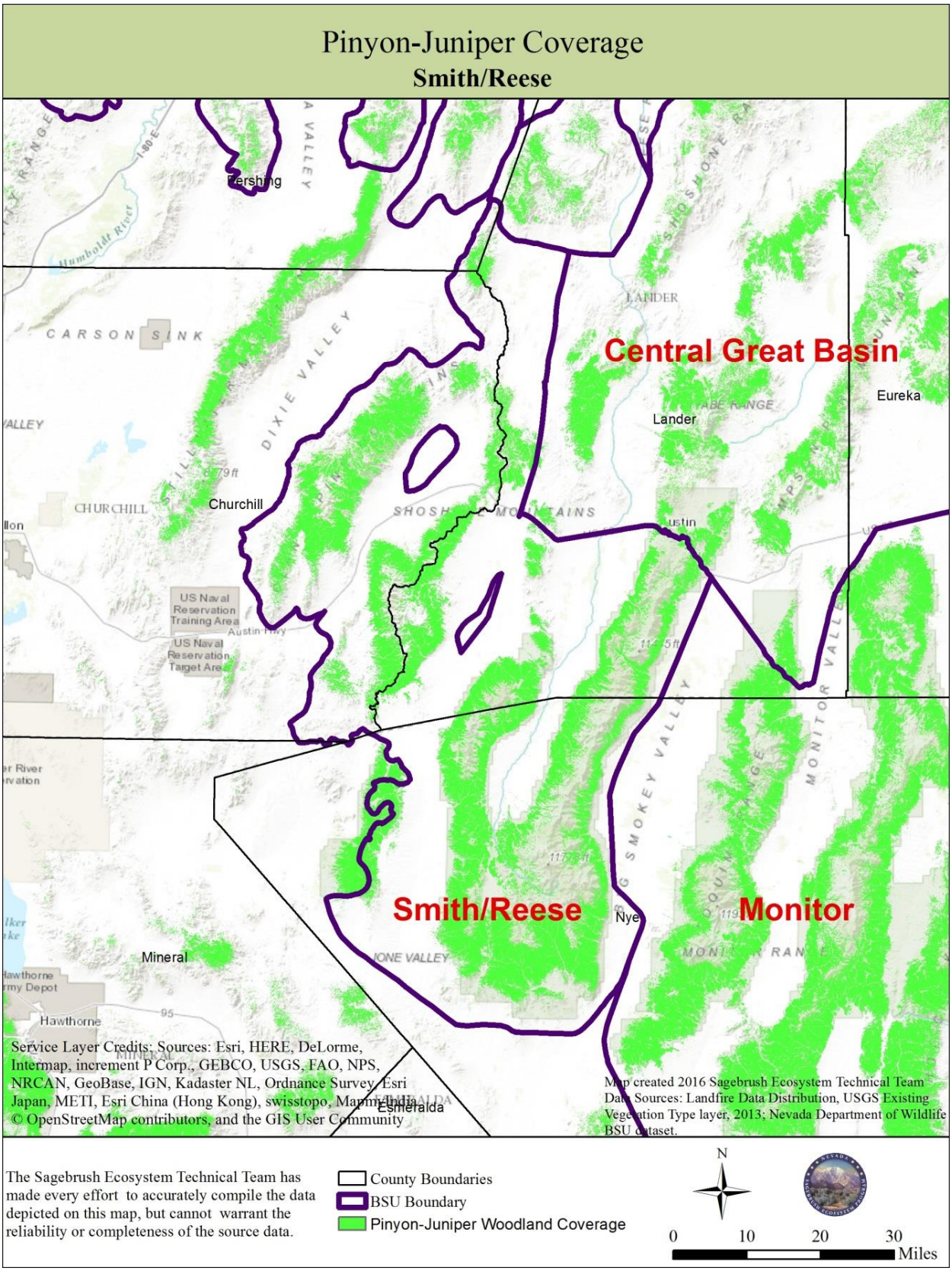
Pinyon-Juniper Coverage
Pueblo Range

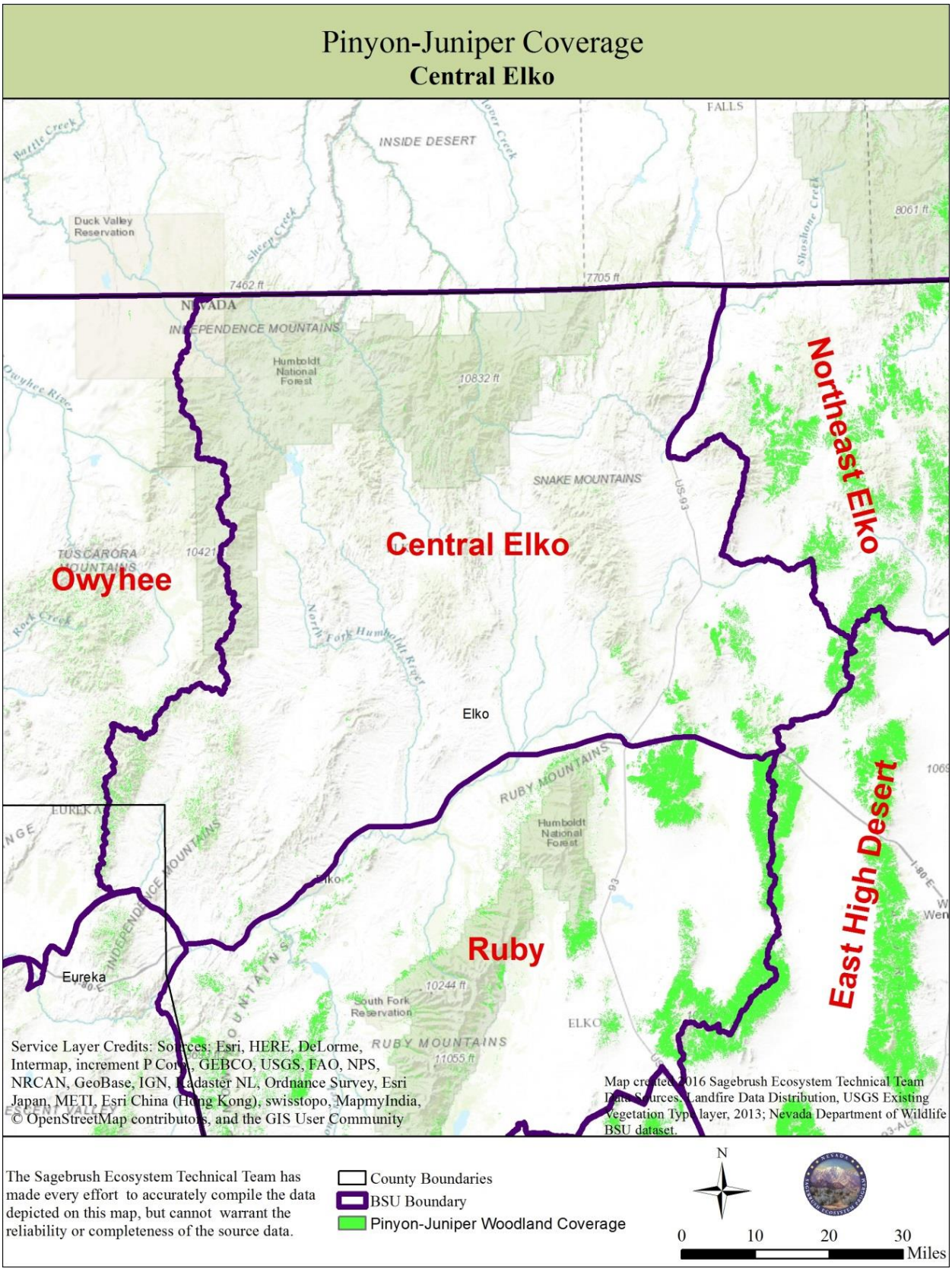



Pinyon-Juniper Coverage
Western Pershing
JACKSON MOUNTAINS
Humboldt
DESERT VALLEY
HUMBOLDT
KAMMA MOUNTAINS
Western Pershing
Western Pershing
Rye Patch Reservoir
I-80-W-I-80-E
Pershing
7794 ft
9822 ft
SAGE VALLEY
SEVEN TROUGH RANGE
HUMBOLDT RANGE
Northwest Interior
I-80-E
I-80-W
Lovelock
GRANITE SPRINGS
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 4 8 12
Miles

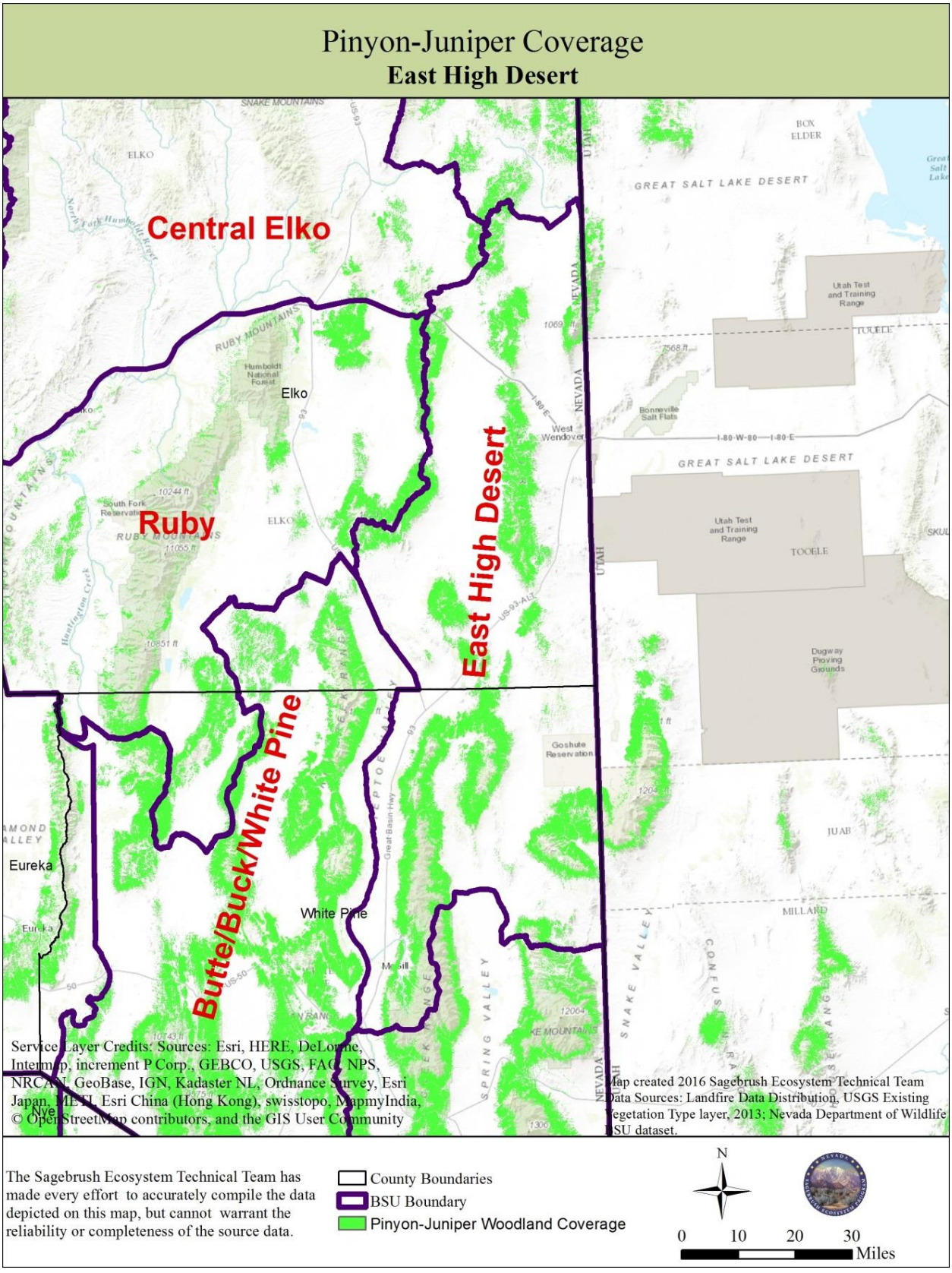

Pinyon-Juniper Coverage
Central Great Basin
Owyhee
Central Elko
Ruby
Central Great Basin
Monitor
Smith/Reese
Butte/Buck/White Pine
Humboldt
Pershing
Churchill
Lander
Eureka
Elko
White Pine
CRESCENT VALLEY
DIAMOND VALLEY
RUBY MOUNTAINS
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles

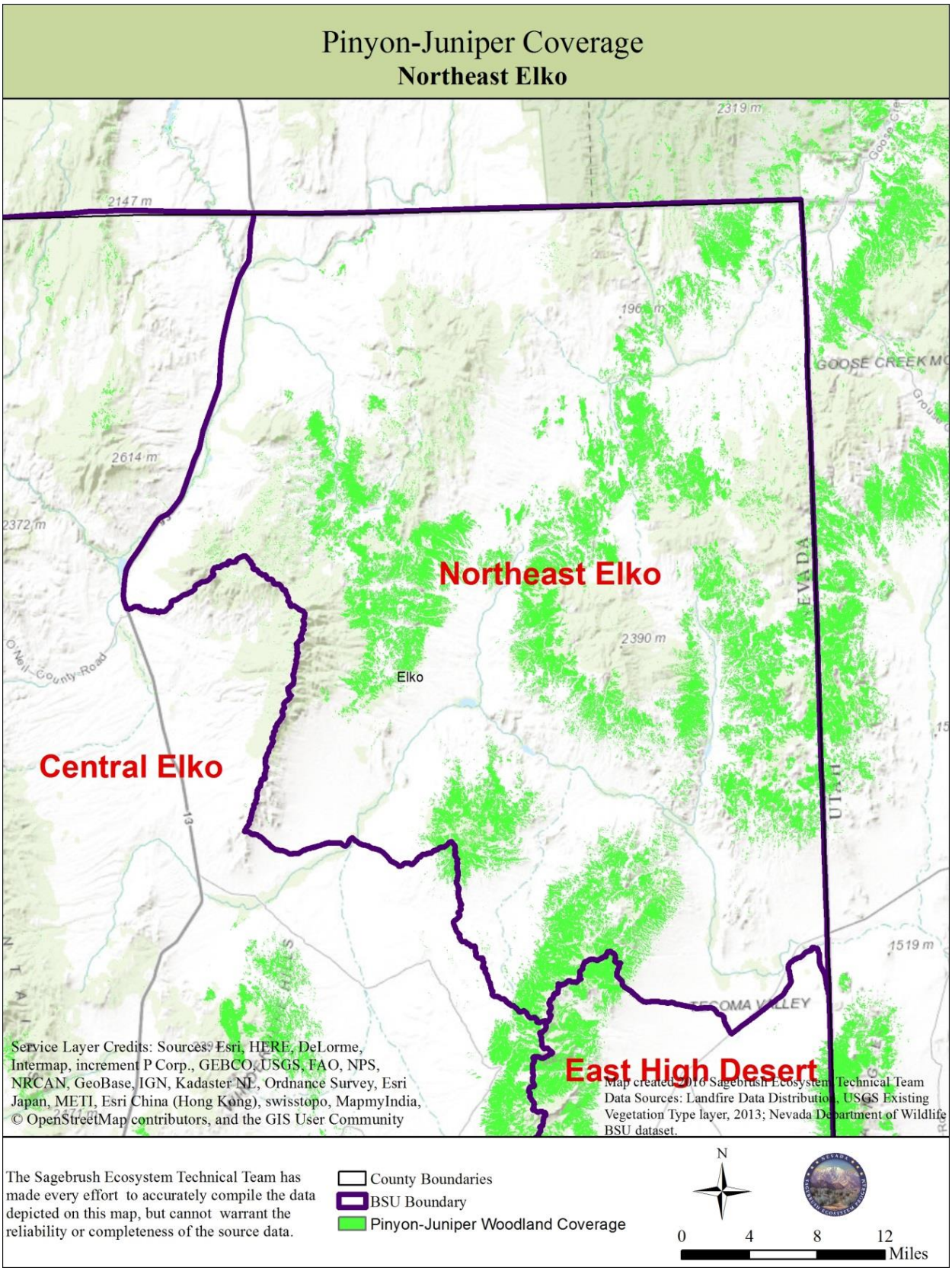

Pinyon-Juniper Coverage
Monitor
Central Great Basin
Butte/Buck/White Pine
Smith/Reese
Monitor
Quinn
Churchill
Lander
Eureka
White Pine
Mineral
Nye
Esmeralda
Tonopah
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Smith/Reese
Central Great Basin
Smith/Reese
Monitor
Pershing
Humboldt River
CARSON SINK
DIXIE VALLEY
LANDER
Eureka
Lander
Churchill
CHURCHILL
US Naval Reservation Training Area
US Naval Reservation Target Area
Austin
Nye
Mineral
Hawthorne
Esmeralda
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Central Elko
Northeast Elko
Central Elko
Owyhee
Ruby
East High Desert
INSIDE DESERT
Duck Valley Reservation
NEVADA
INDEPENDENCE MOUNTAINS
Humboldt National Forest
SNAKE MOUNTAINS
TUSCARORA MOUNTAINS
Elko
RUBY MOUNTAINS
Eureka
South Fork Reservation
ELKO
7462 ft
7705 ft
8061 ft
10832 ft
10244 ft
11055 ft
Owyhee River
North Fork Humboldt River
Sheep Creek
Shoshone Creek
US-93
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles

DRAFT


Pinyon-Juniper Coverage
East High Desert
Central Elko
Ruby
East High Desert
Butte/Buck/White Pine
White Pine
Elkо
Eureka
Nye
ELKO
WHITE PINE
JUAB
MILLARD
TOOELE
BOX ELDER
GREAT SALT LAKE DESERT
Utah Test and Training Range
Dugway Proving Grounds
Bonneville Salt Flats
Goshute Reservation
SNAKE MOUNTAINS
RUBY MOUNTAINS
SPRING VALLEY
SNAKE VALLEY
NEVADA
UTAH
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Northeast Elko
Northeast Elko
Central Elko
East High Desert
Elko
O'Neil County Road
2319 m
2147 m
2614 m
2372 m
2390 m
1519 m
GOOSE CREEK M
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
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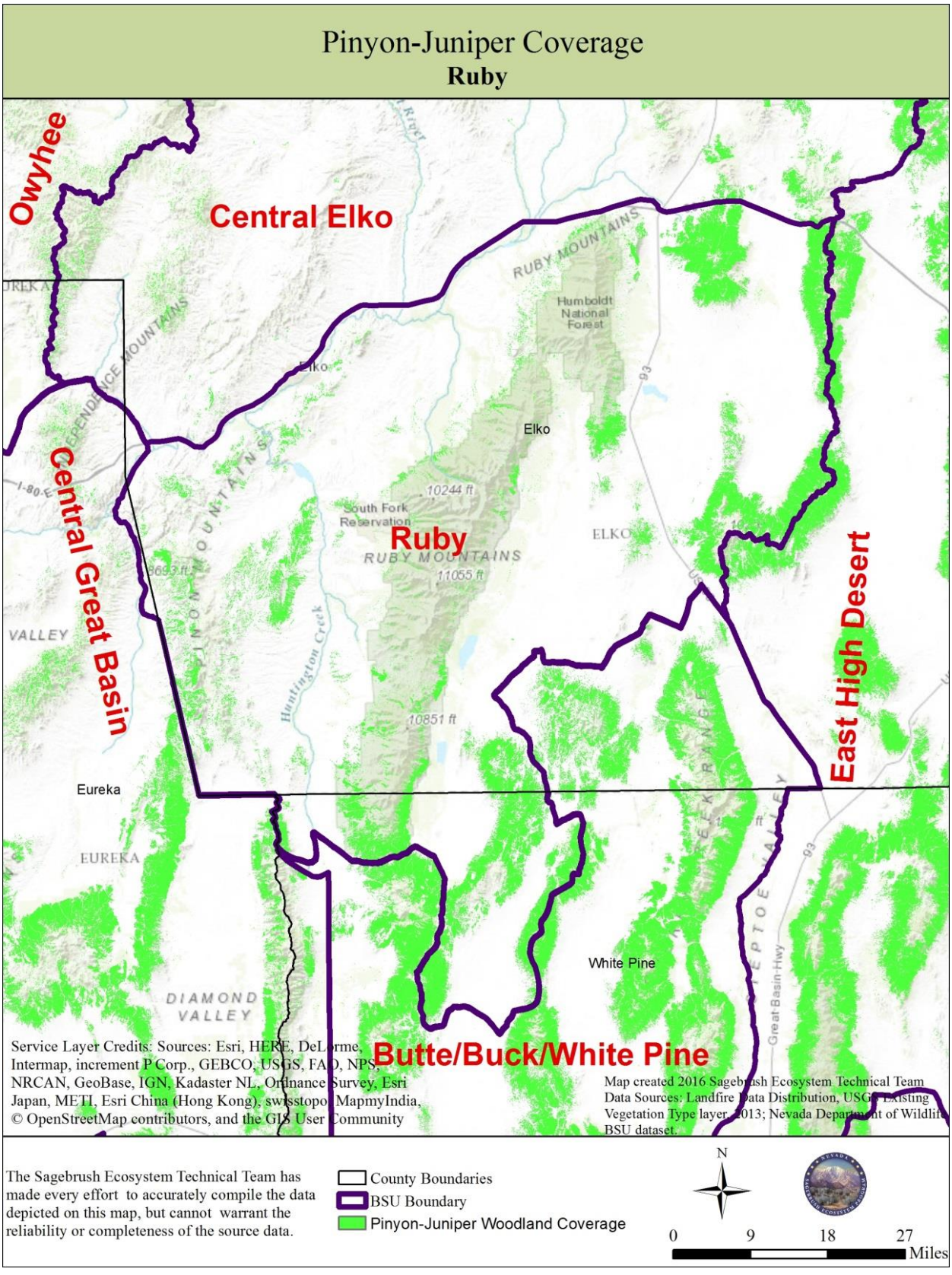
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 4 8 12
Miles


Pinyon-Juniper Coverage
Ruby
Owyhee
Central Elko
Central Great Basin
Ruby
East High Desert
Butte/Buck/White Pine
RUBY MOUNTAINS
Humboldt National Forest
Elko
South Fork Reservation
10244 ft
11055 ft
10851 ft
ELKO
Eureka
EUREKA
VALLEY
White Pine
DIAMOND VALLEY
Great Basin Hwy
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS, Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
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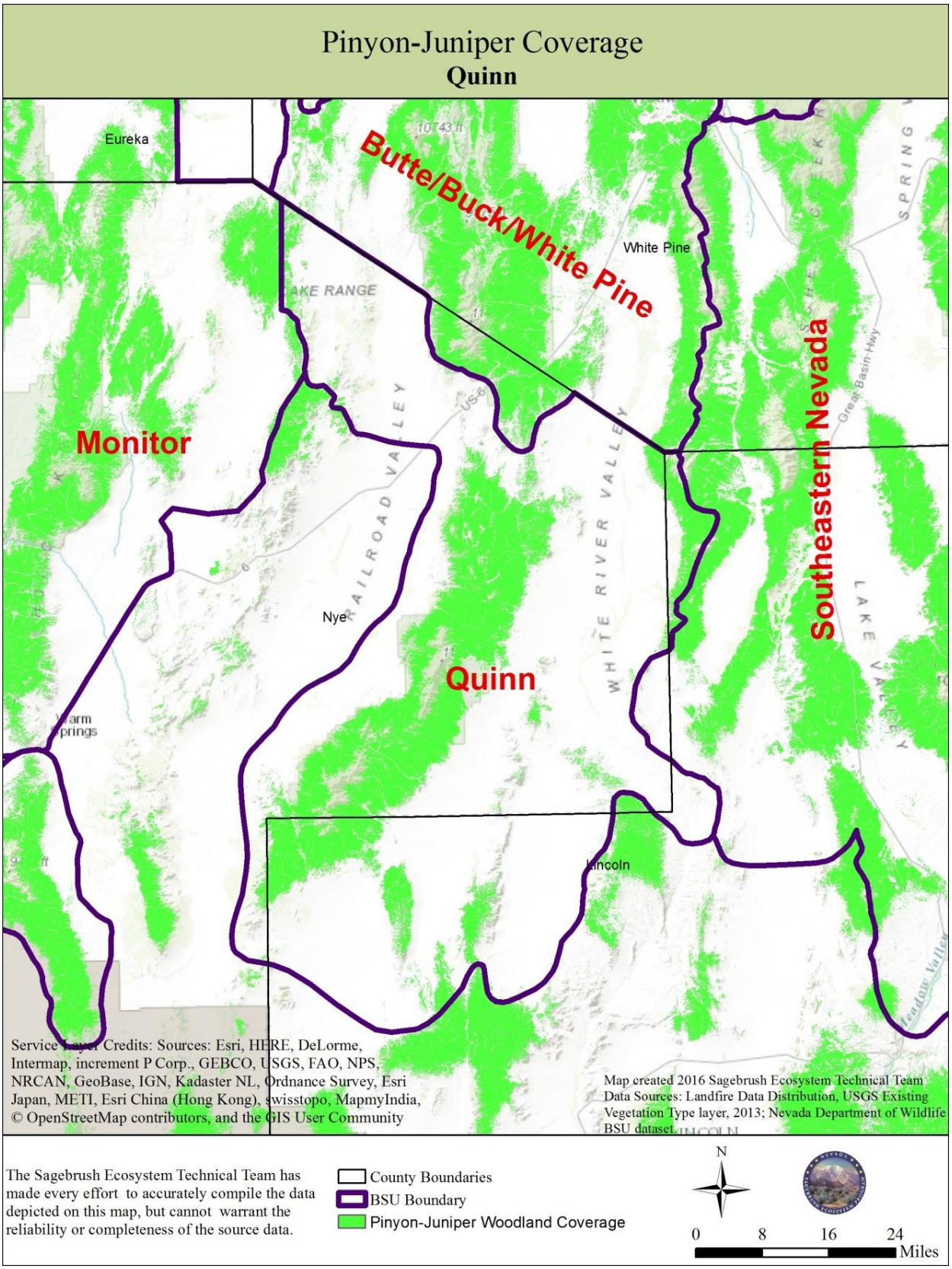
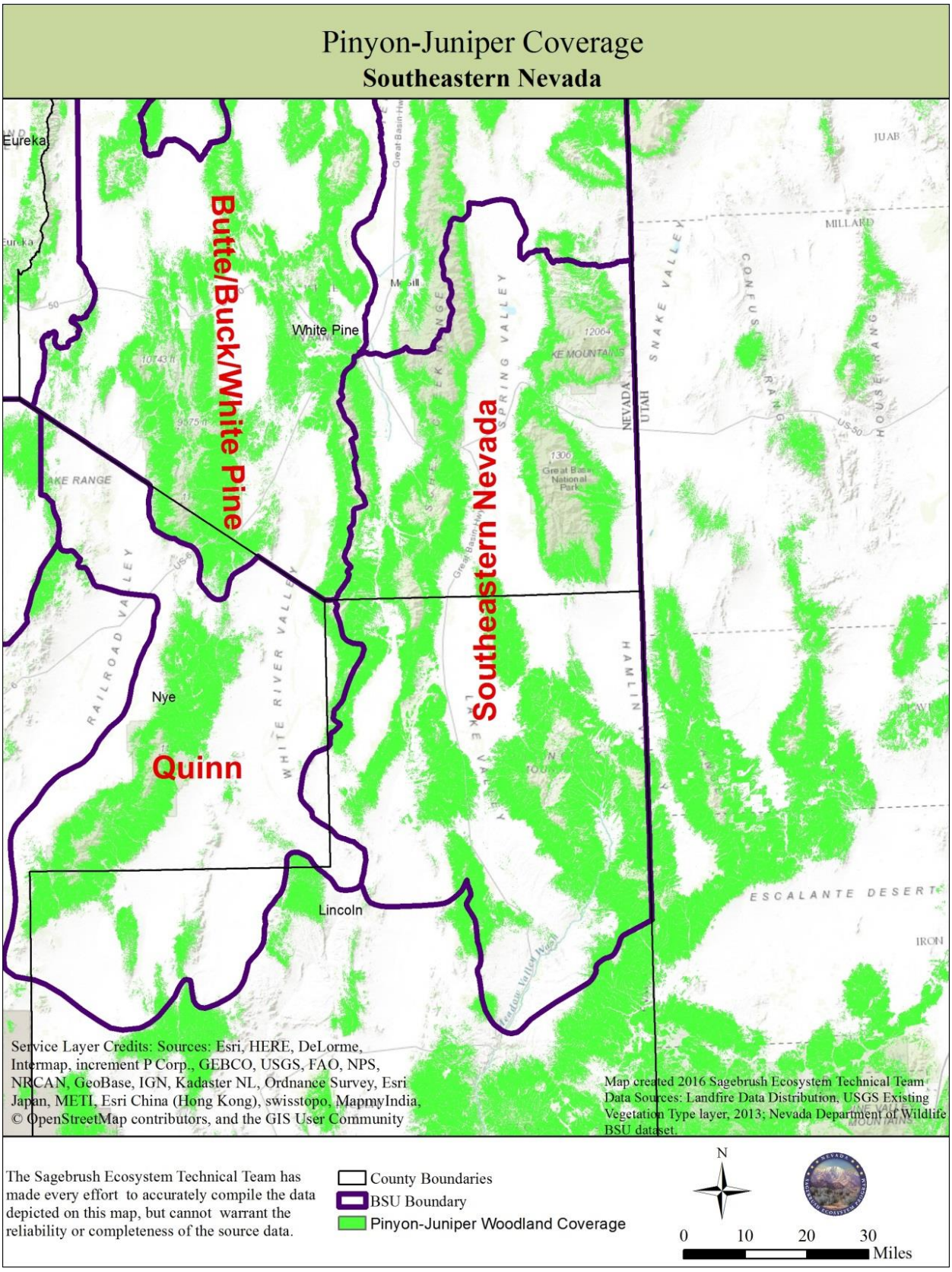
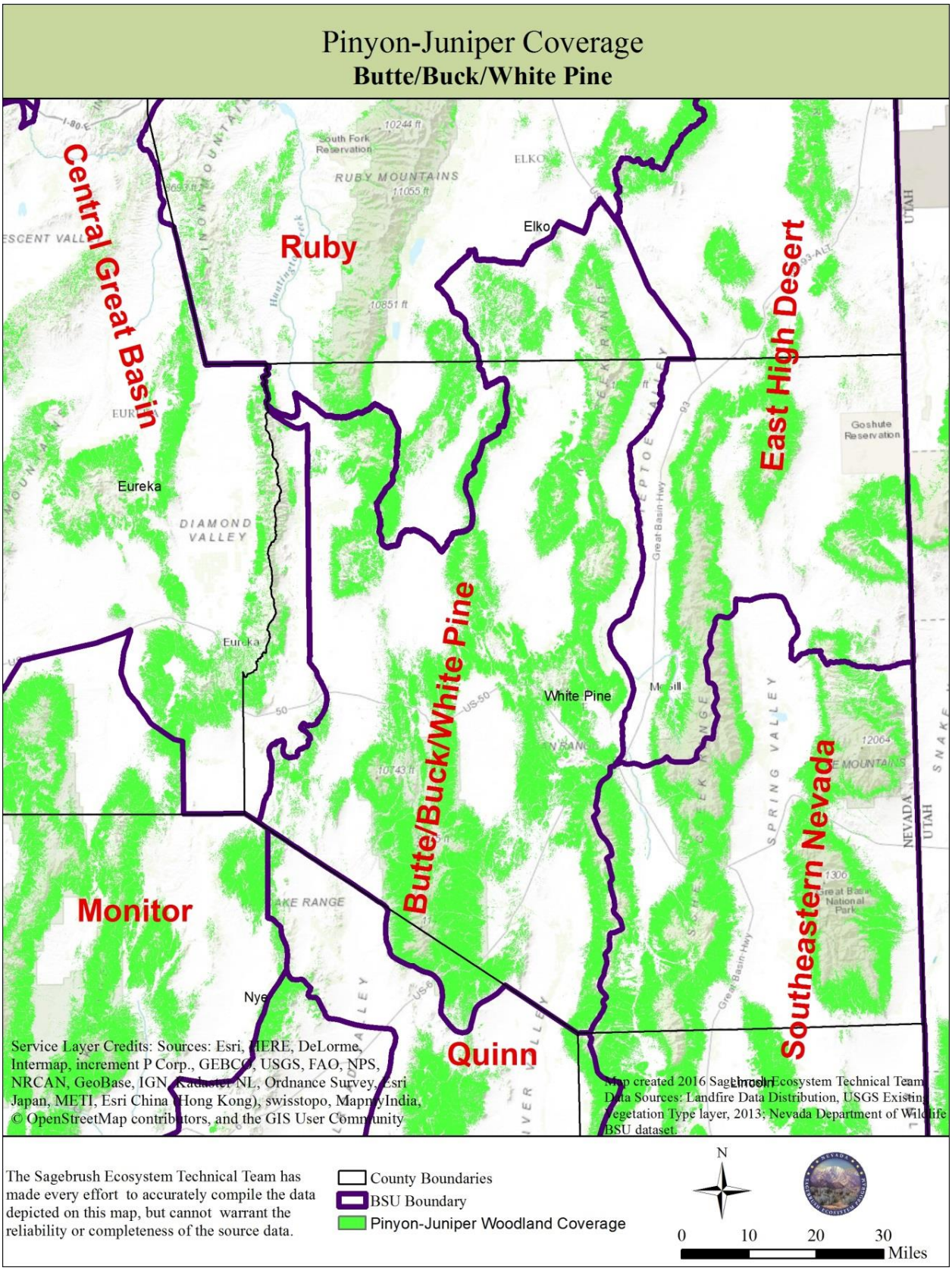
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 9 18 27
Miles


Pinyon-Juniper Coverage
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Southeastern Nevada
Nye
Quinn
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 8 16 24
Miles


Pinyon-Juniper Coverage
Southeastern Nevada
Eureka
White Pine
Nye
Lincoln
Butte/Buck/White Pine
Southeastern Nevada
Quinn
JUAB
MILLARD
IRON
SNAKE VALLEY
SPRING VALLEY
HAMLIN VALLEY
WHITE RIVER VALLEY
RAILROAD VALLEY
ESCALANTE DESERT
NEVADA
UTAH
Great Basin National Park
US-50
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles


Pinyon-Juniper Coverage
Butte/Buck/White Pine
Central Great Basin
Ruby
East High Desert
Butte/Buck/White Pine
Monitor
Quinn
Southeastern Nevada
Elko
Eureka
White Pine
Nye
Lincoln
RUBY MOUNTAINS
DIAMOND VALLEY
SPRING VALLEY
Goshute Reservation
South Fork Reservation
Great Basin National Park
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Landfire Data Distribution, USGS Existing Vegetation Type layer, 2013; Nevada Department of Wildlife BSU dataset.
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County Boundaries
BSU Boundary
Pinyon-Juniper Woodland Coverage
N
0 10 20 30
Miles

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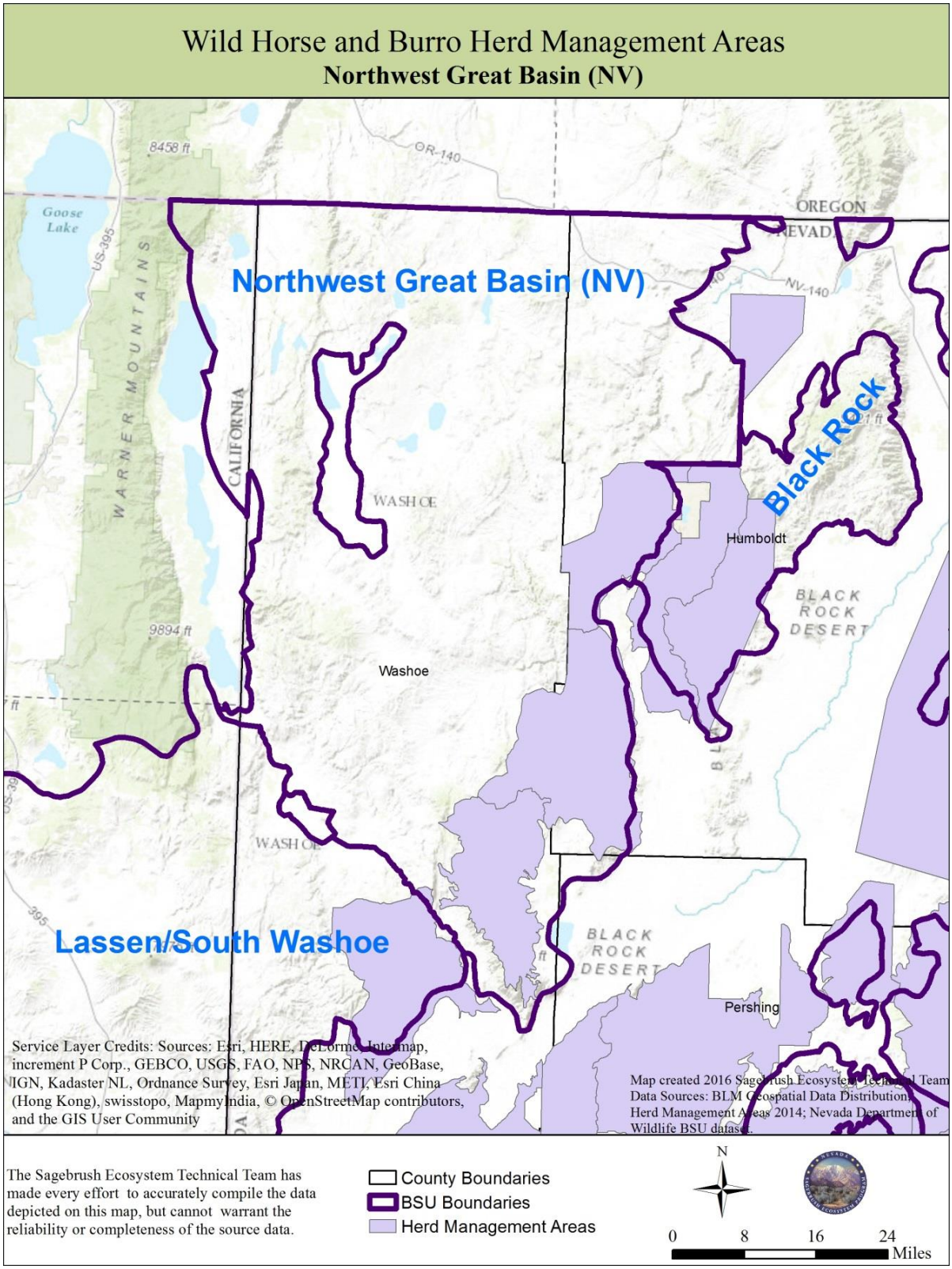
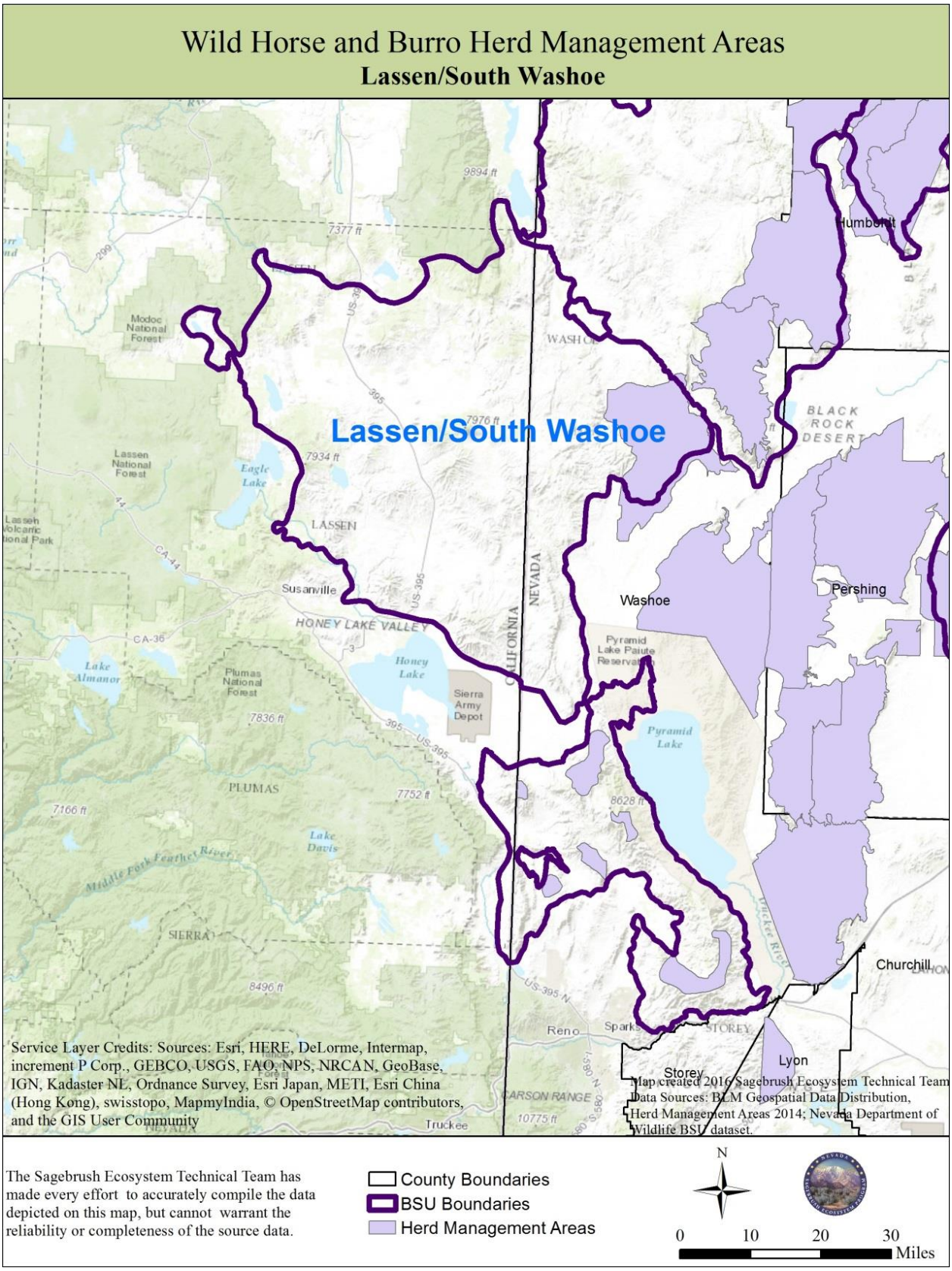
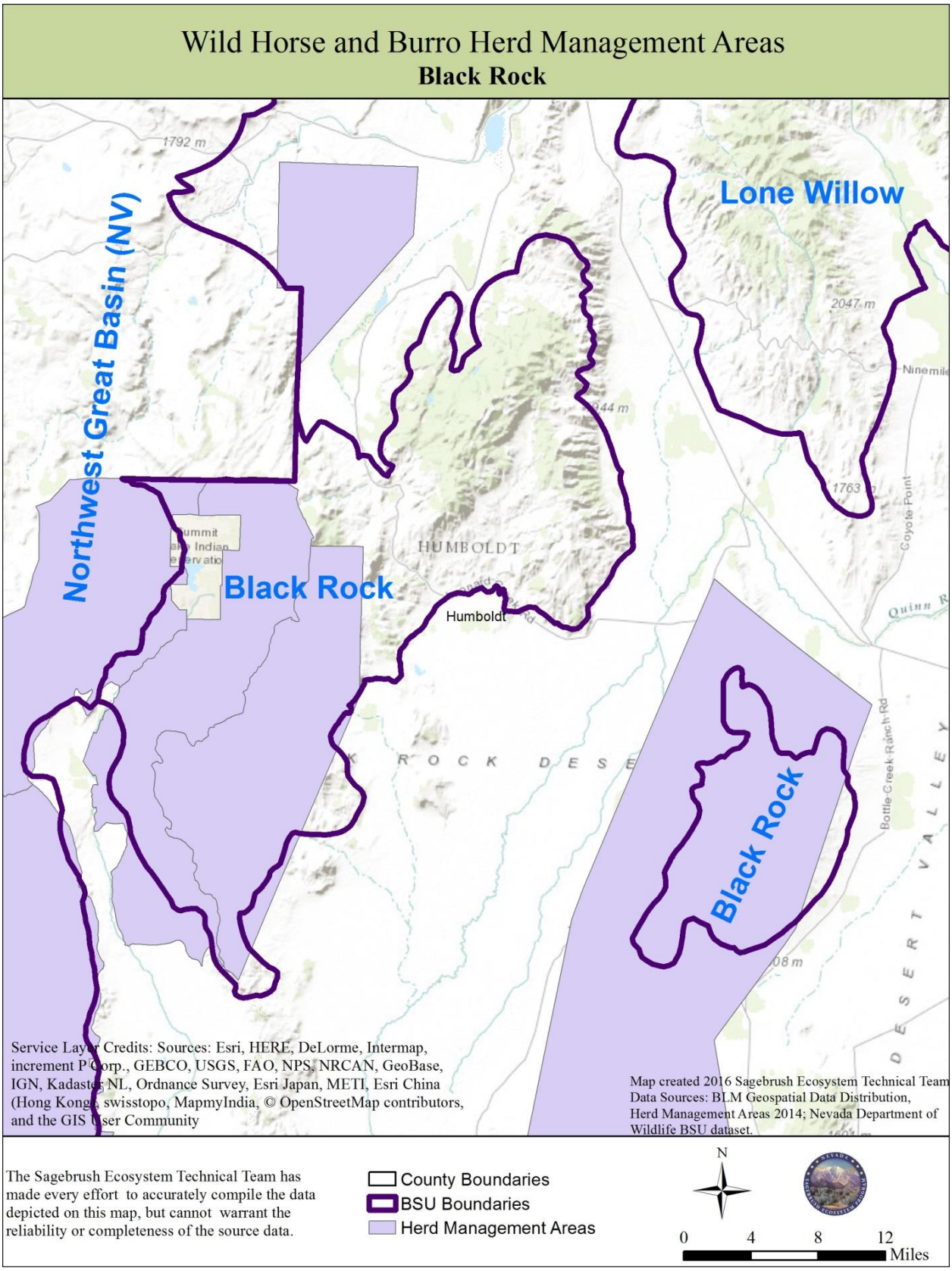
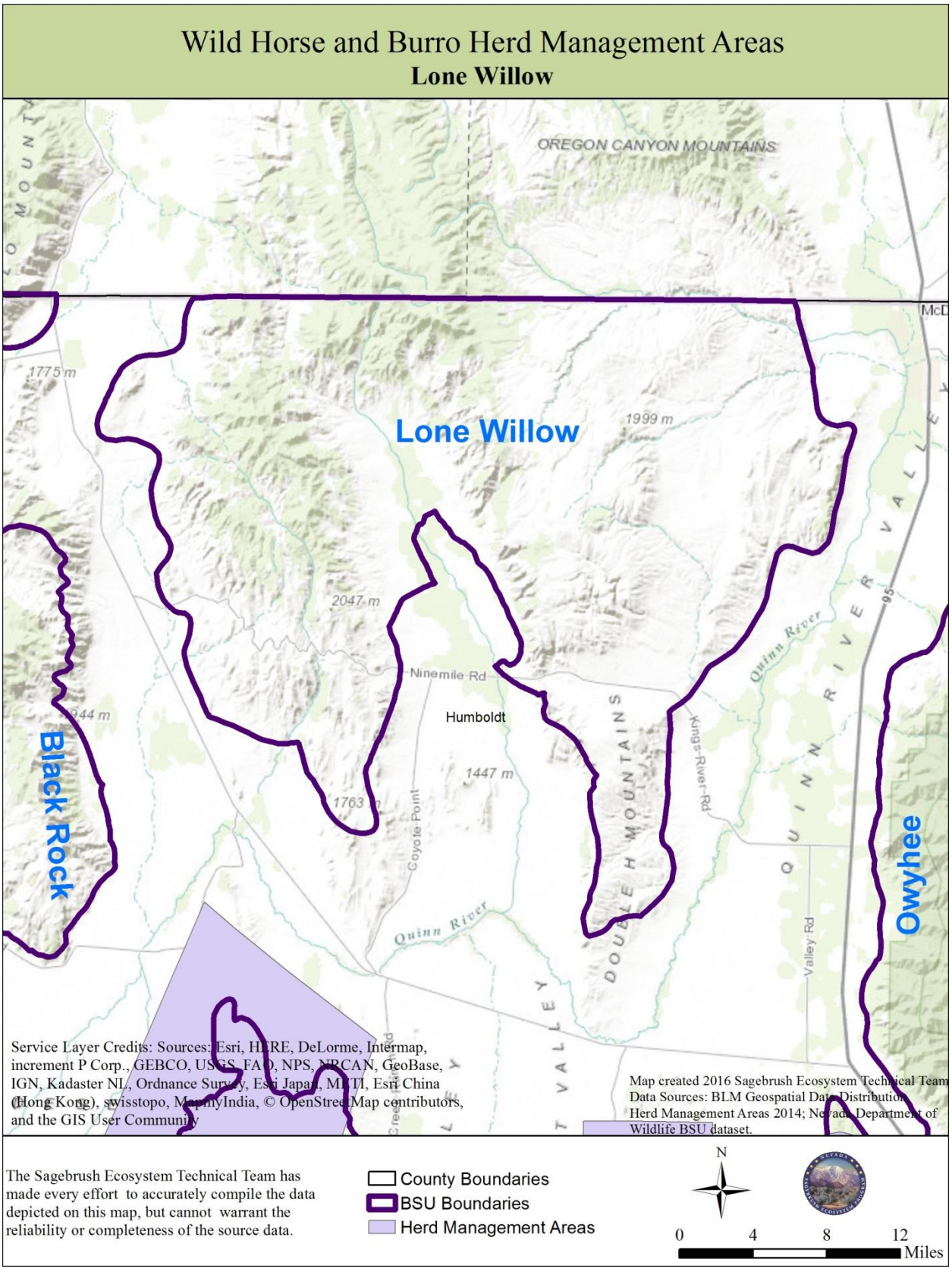
Appendix D. Wild Horse and Burro Herd Management Areas by BSU

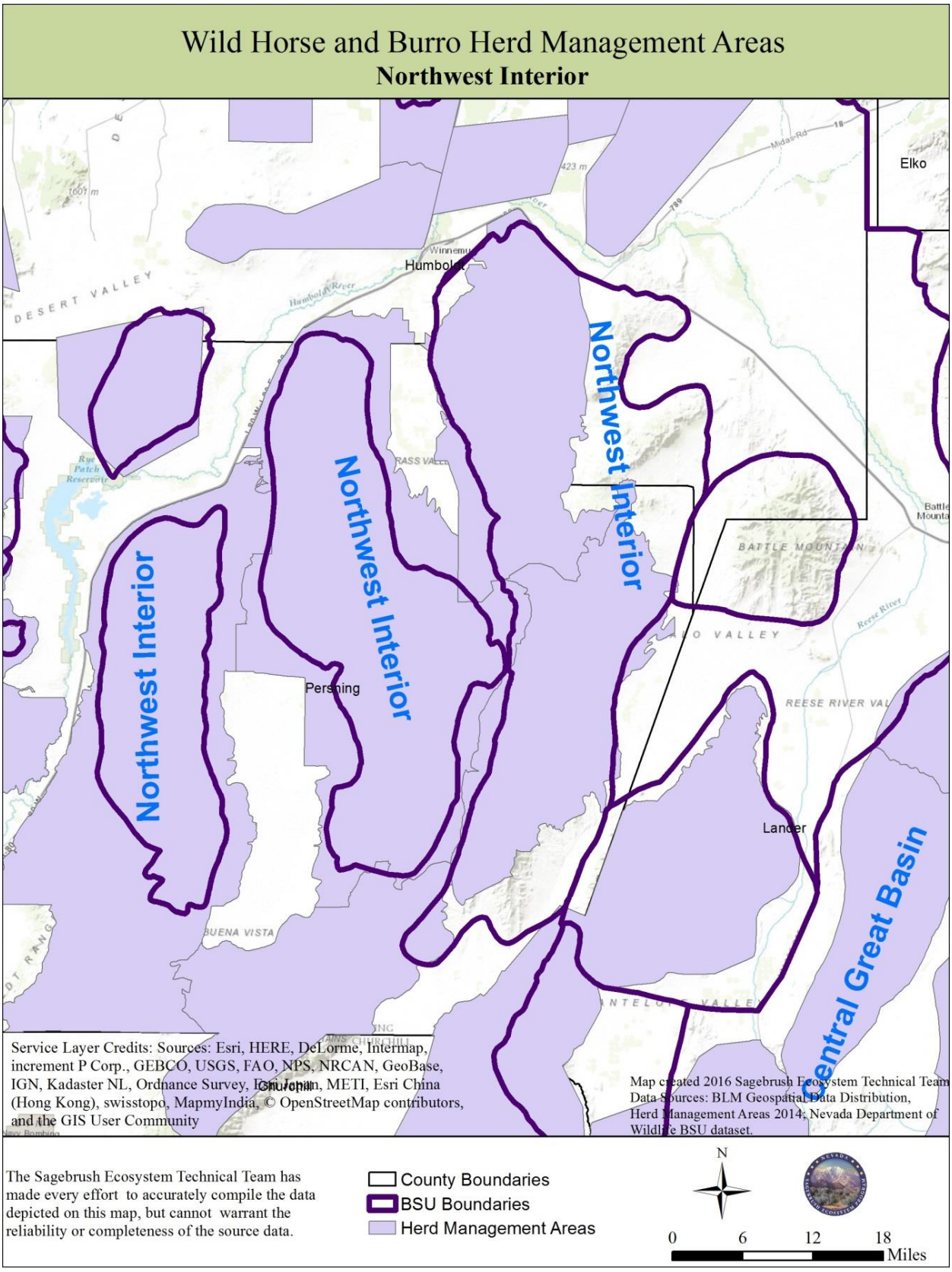


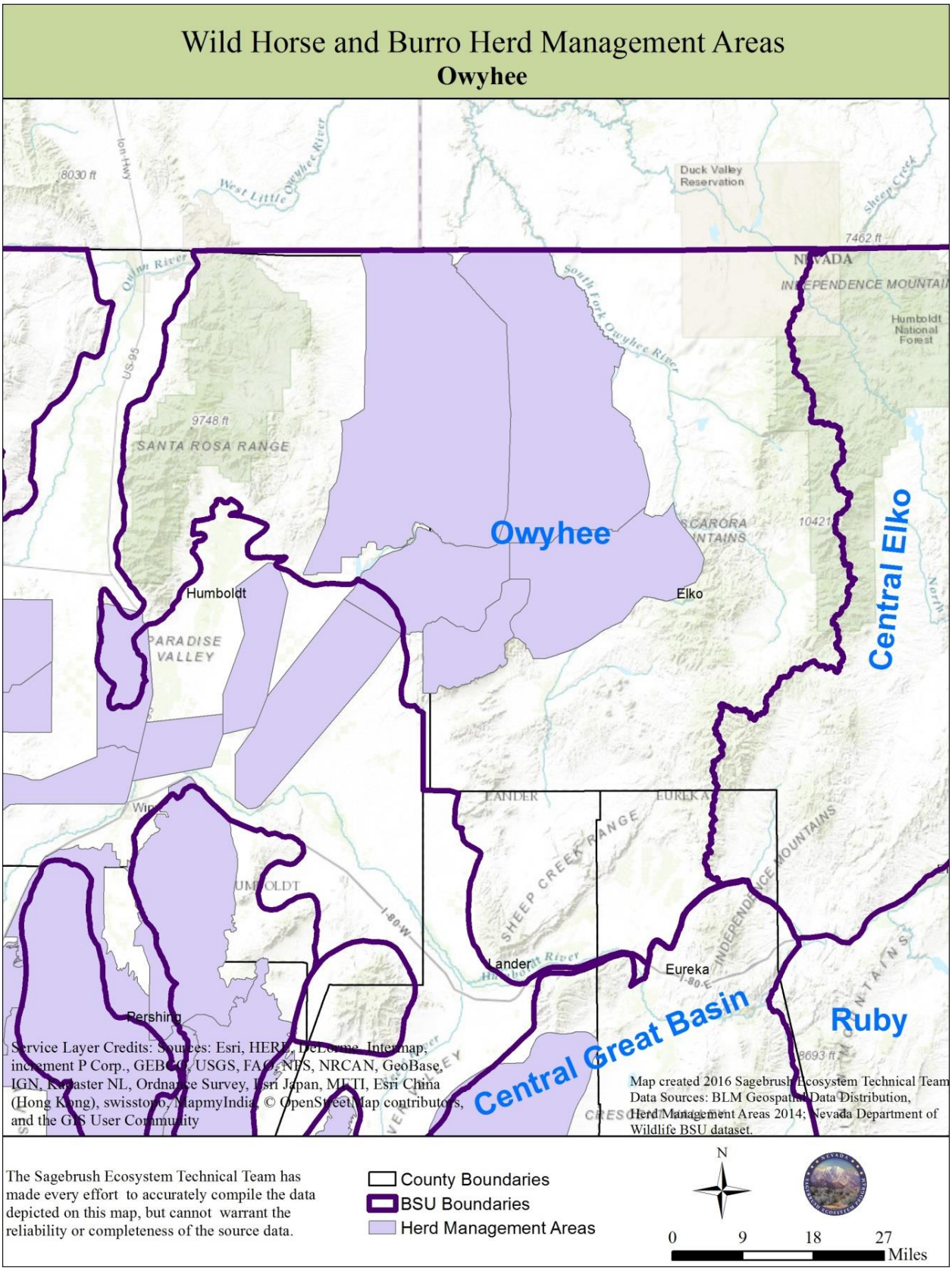

Wild Horse and Burro Herd Management Areas
Lassen/South Washoe
Lassen/South Washoe
Humboldt
Modoc National Forest
Lassen National Forest
Eagle Lake
LASSEN
Susanville
HONEY LAKE VALLEY
Lake Almanor
Plumas National Forest
Honey Lake
Sierra Army Depot
PLUMAS
Lake Davis
Middle Fork Feather River
SIERRA
CALIFORNIA
NEVADA
BLACK ROCK DESERT
Washoe
Pershing
Pyramid Lake Paiute Reservation
Pyramid Lake
Churchill
Reno
Sparks
STOREY
Storey
Lyon
CARSON RANGE
Truckee
9894 ft
7377 ft
7976 ft
7934 ft
7836 ft
7752 ft
7166 ft
8628 ft
8496 ft
10775 ft
US-395
US-395 N
CA-44
CA-36
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
Black Rock
Northwest Great Basin (NV)
Lone Willow
Black Rock
Black Rock
Humboldt
HUMBOLDT
1792 m
2047 m
1763
Coyote Point
Ninemile
Bottle Creek Ranch Rd
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 4 8 12
Miles


Wild Horse and Burro Herd Management Areas
Lone Willow
OREGON CANYON MOUNTAINS
Lone Willow
Black Rock
Owyhee
1775 m
1999 m
2047 m
1763
1447 m
Ninemile Rd
Humboldt
Quinn River
Coyote Point
Kings River Rd
Valley Rd
DOUBLE H MOUNTAINS
QUINN RIVER VALLEY
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution
Herd Management Areas 2014; Nevada Department of
Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 4 8 12
Miles

DRAFT


Wild Horse and Burro Herd Management Areas
Northwest Interior
Northwest Interior
Northwest Interior
Northwest Interior
Central Great Basin
Elko
Humboldt
Winnemucca
Pershing
Lander
DESERT VALLEY
BATTLE MOUNTAIN
REESE RIVER VAL
BUENA VISTA
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 6 12 18
Miles


Wild Horse and Burro Herd Management Areas
Owyhee
Owyhee
Central Elko
Central Great Basin
Ruby
Humboldt
Elko
Lander
Eureka
Pershing
Duck Valley Reservation
Humboldt National Forest
SANTA ROSA RANGE
PARADISE VALLEY
SHEEP CREEK RANGE
INDEPENDENCE MOUNTAINS
8030 ft
9748 ft
7462 ft
10421 ft
8693 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
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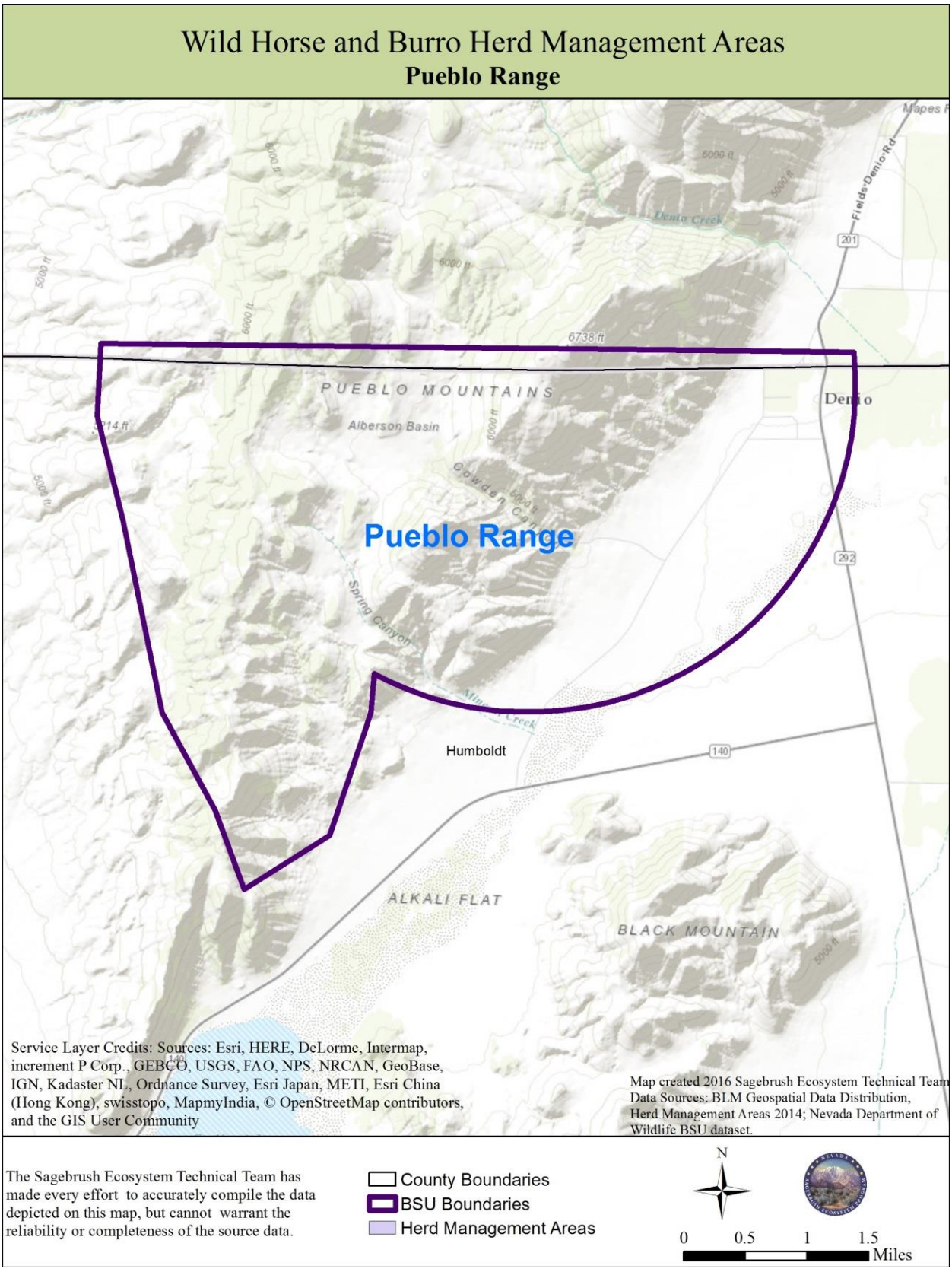
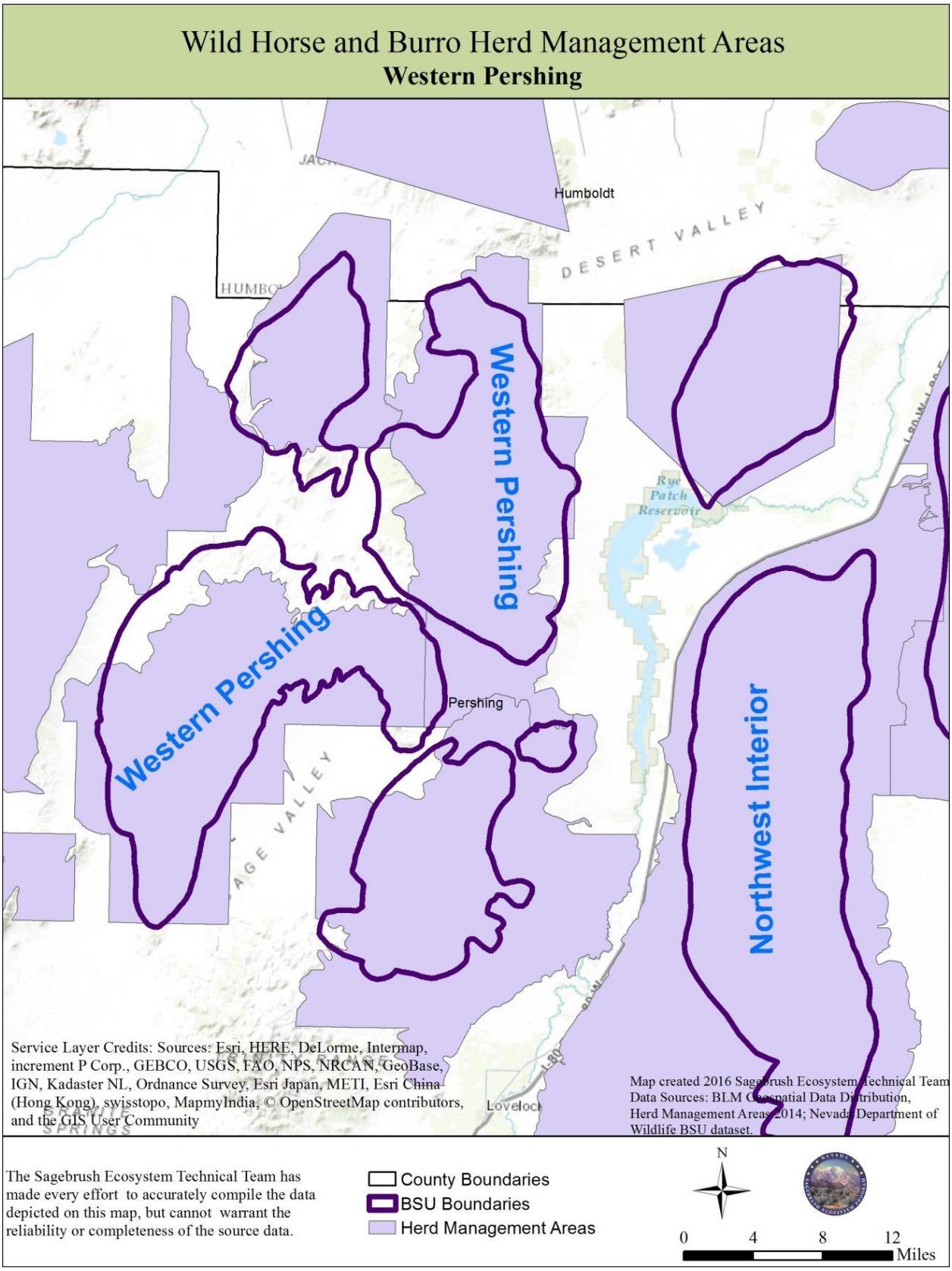
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 9 18 27
Miles


Wild Horse and Burro Herd Management Areas
Pueblo Range
PUEBLO MOUNTAINS
Alberson Basin
Crowder Canyon
Pueblo Range
Spring Canyon
Denio Creek
Fields-Denio Rd
Denio
Humboldt
ALKALI FLAT
BLACK MOUNTAIN
6738 ft
5000 ft
6000 ft
201
292
140
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 0.5 1 1.5
Miles


Wild Horse and Burro Herd Management Areas
Western Pershing
Humboldt
DESERT VALLEY
Western Pershing
Western Pershing
Rye Patch Reservoir
Pershing
Northwest Interior
Loveloch
I-80
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
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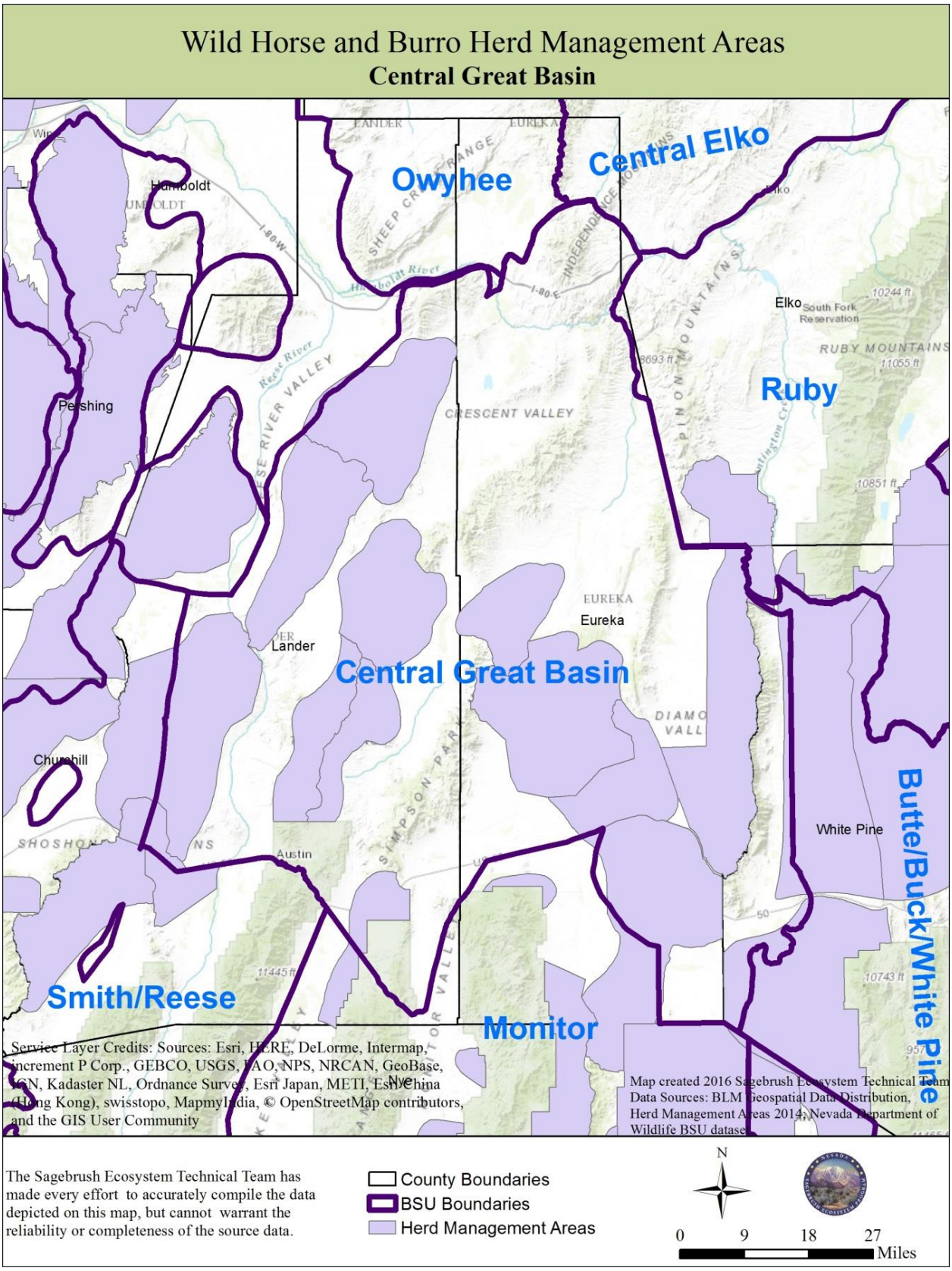
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 4 8 12
Miles


Wild Horse and Burro Herd Management Areas
Central Great Basin
Owyhee
Central Elko
Ruby
Central Great Basin
Butte/Buck/White Pine
Smith/Reese
Monitor
Humboldt
Pershing
Lander
Eureka
Elko
White Pine
Churchill
Austin
Nye
CRESCENT VALLEY
RUBY MOUNTAINS
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
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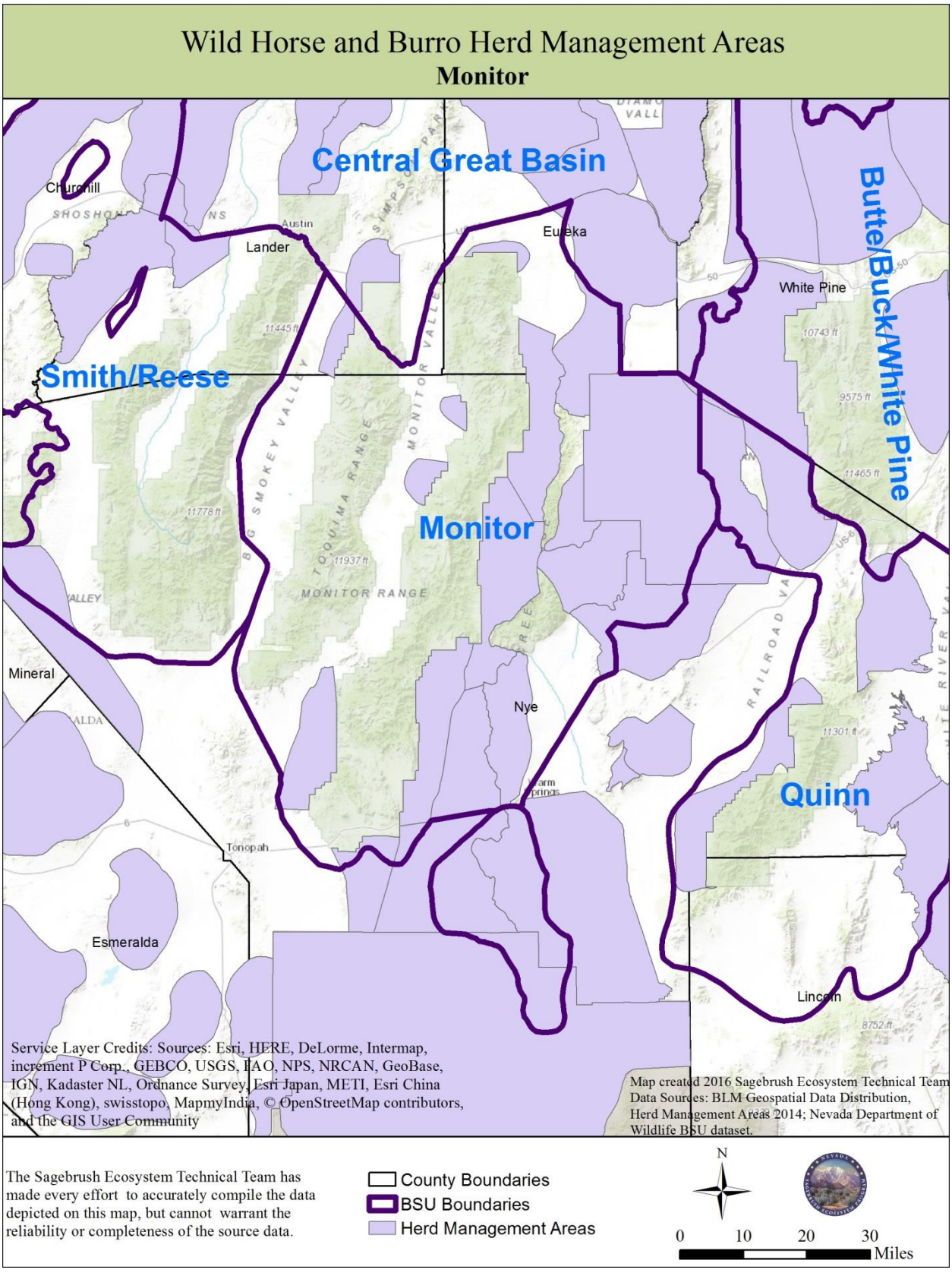
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 9 18 27
Miles


Wild Horse and Burro Herd Management Areas
Monitor
Central Great Basin
Butte/Buck/White Pine
Smith/Reese
Monitor
Quinn
Churchill
Austin
Lander
Eureka
White Pine
Mineral
Nye
Tonopah
Esmeralda
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
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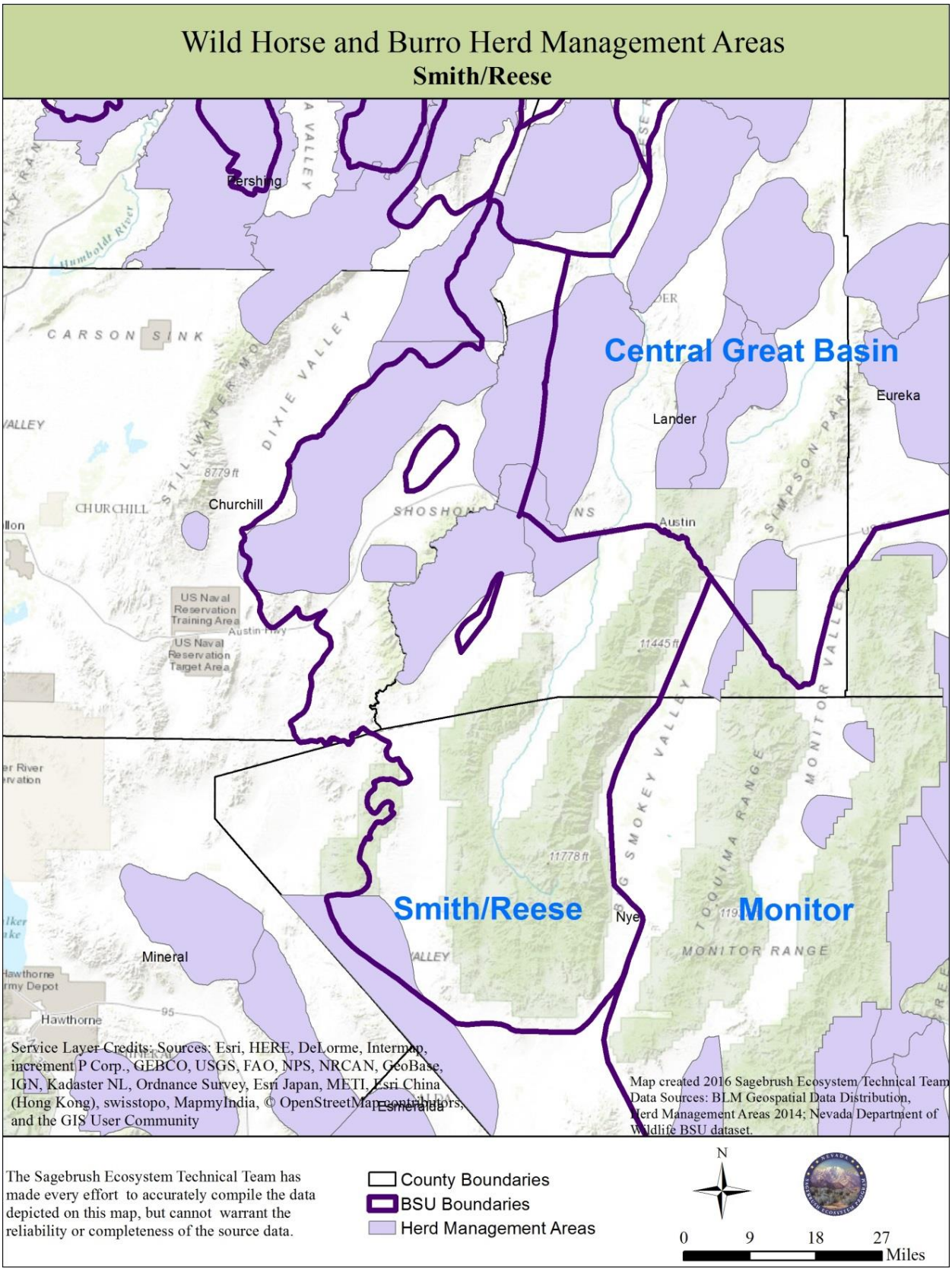
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 10 20 30
Miles


Wild Horse and Burro Herd Management Areas
Smith/Reese
Central Great Basin
Smith/Reese
Monitor
Pershing
Humboldt River
CARSON SINK
DIXIE VALLEY
STILLWATER MO
CHURCHILL
Churchill
8779 ft
Lander
Eureka
SIMPSON PARK
Austin
SHOSHONE
US Naval Reservation Training Area
US Naval Reservation Target Area
11445 ft
SMOKEY VALLEY
TOQUIMA RANGE
MONITOR VALLEY
MONITOR RANGE
11778 ft
Nye
Mineral
Hawthorne
Esmeralda
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
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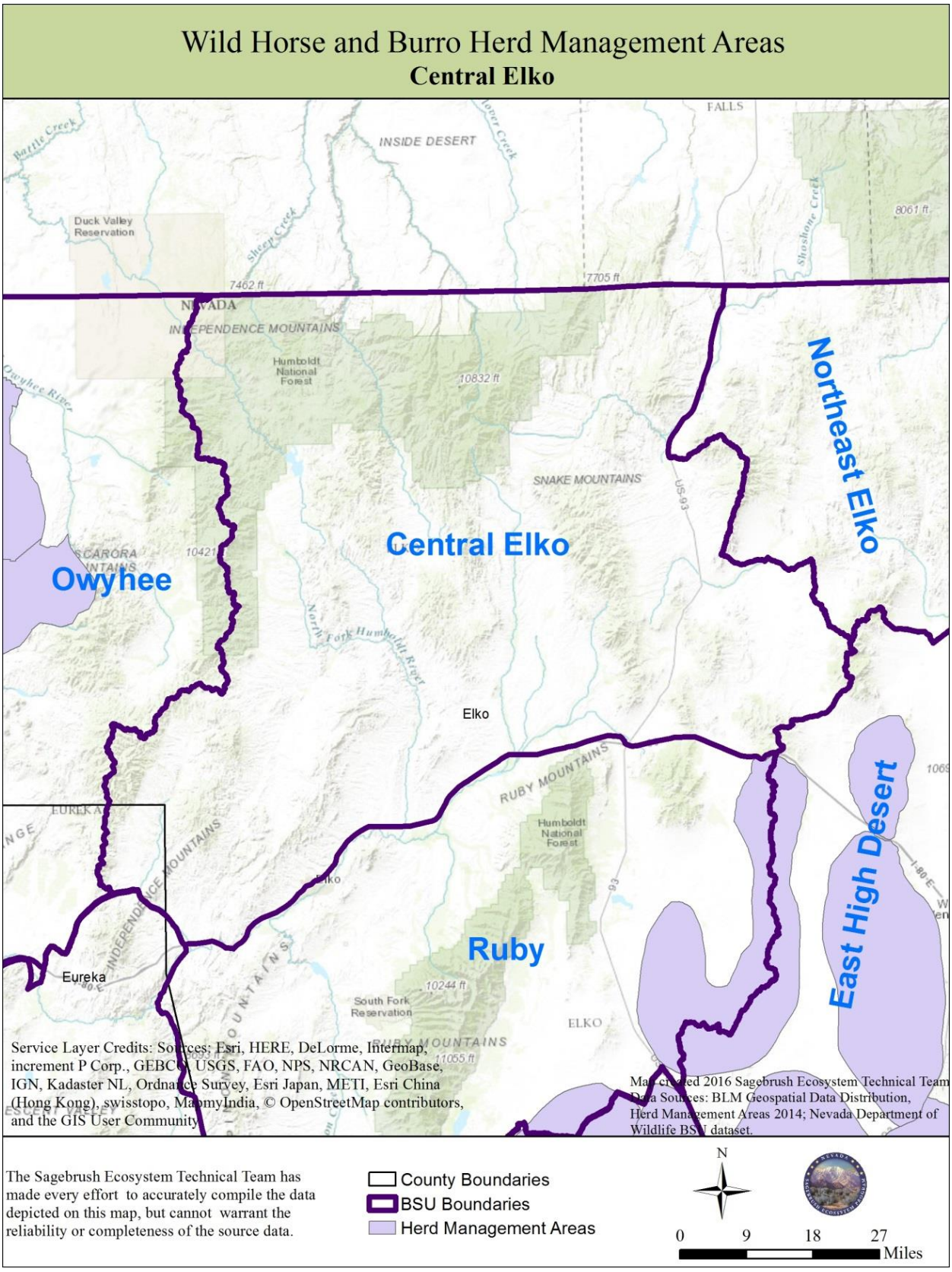
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 9 18 27
Miles

DRAFT


Wild Horse and Burro Herd Management Areas
Central Elko
Northeast Elko
Central Elko
Owyhee
Ruby
East High Desert
INSIDE DESERT
Duck Valley Reservation
NEVADA
INDEPENDENCE MOUNTAINS
Humboldt National Forest
SNAKE MOUNTAINS
Elko
RUBY MOUNTAINS
Eureka
South Fork Reservation
ELKO
7462 ft
7705 ft
8061 ft
10832 ft
10244 ft
11055 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
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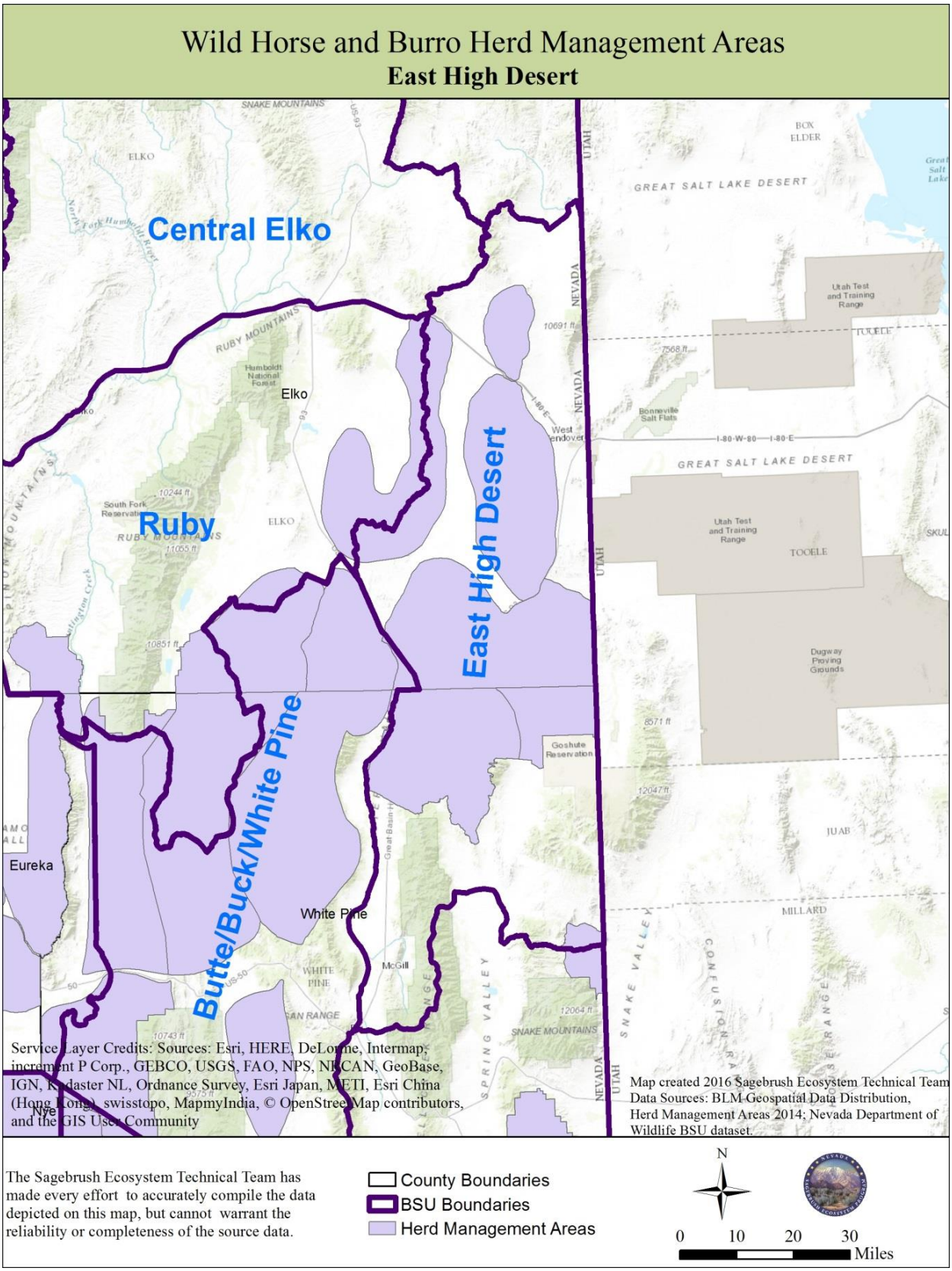
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 9 18 27
Miles

DRAFT


Wild Horse and Burro Herd Management Areas
East High Desert
Central Elko
Ruby
East High Desert
Butte/Buck/White Pine
SNAKE MOUNTAINS
ELKO
NORTH FORK HUMBOLDT RIVER
RUBY MOUNTAINS
Humboldt National Forest
Elko
South Fork Reservation
10244 ft
11055 ft
10851 ft
10691 ft
7568 ft
NEVADA
UTAH
BOX ELDER
GREAT SALT LAKE DESERT
Great Salt Lake
Utah Test and Training Range
TOOELE
Bonneville Salt Flats
I-80-W-80 I-80-E
West Wendover
Goshute Reservation
8571 ft
12047 ft
JUAB
MILLARD
Eureka
White Pine
WHITE PINE
McGill
US-50
SAN RANGE
10743 ft
12064 ft
SNAKE MOUNTAINS
SPRING VALLEY
SNAKE VALLEY
CONFUSION RANGE
Dugway Proving Grounds
Nye
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
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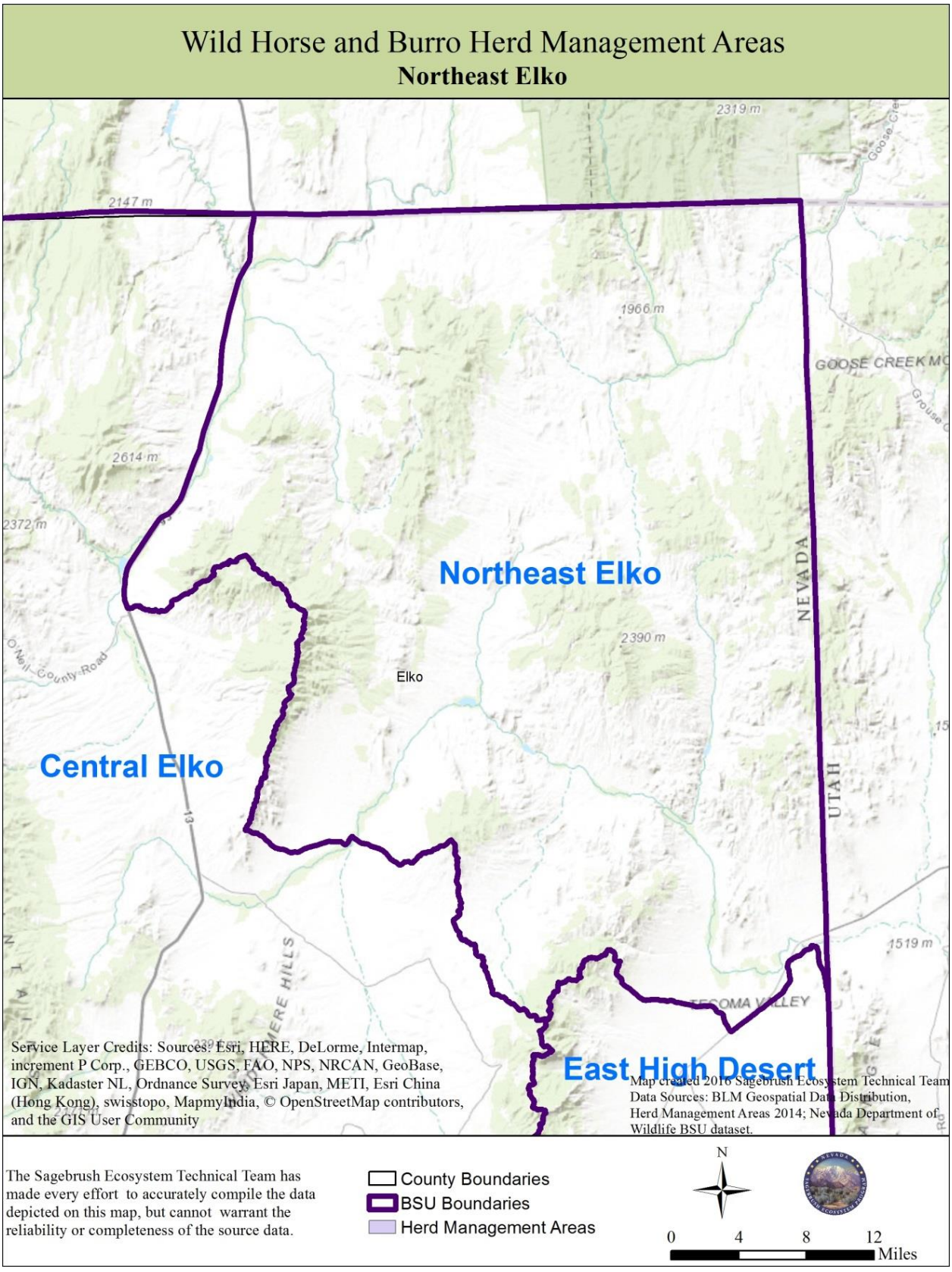
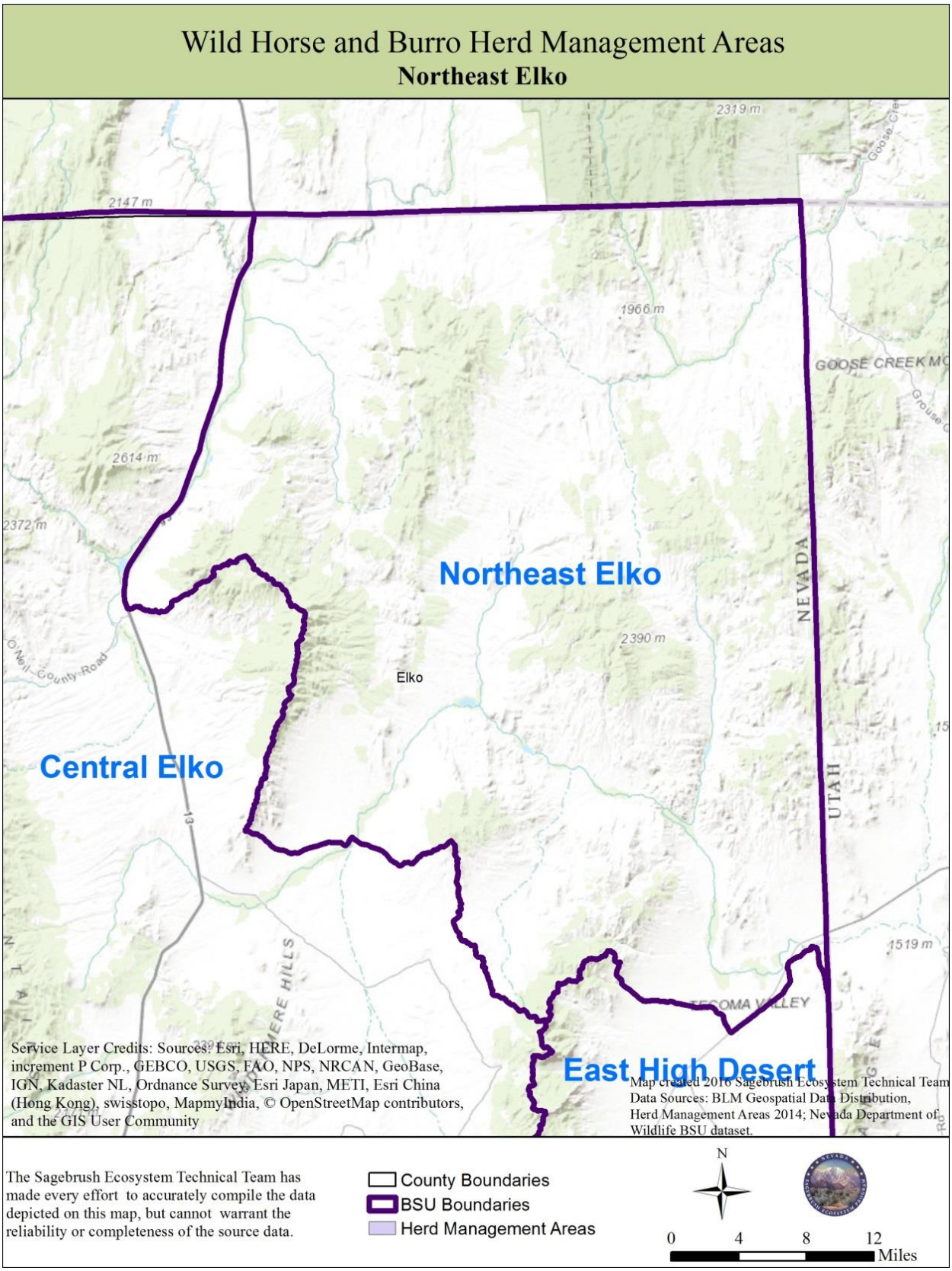
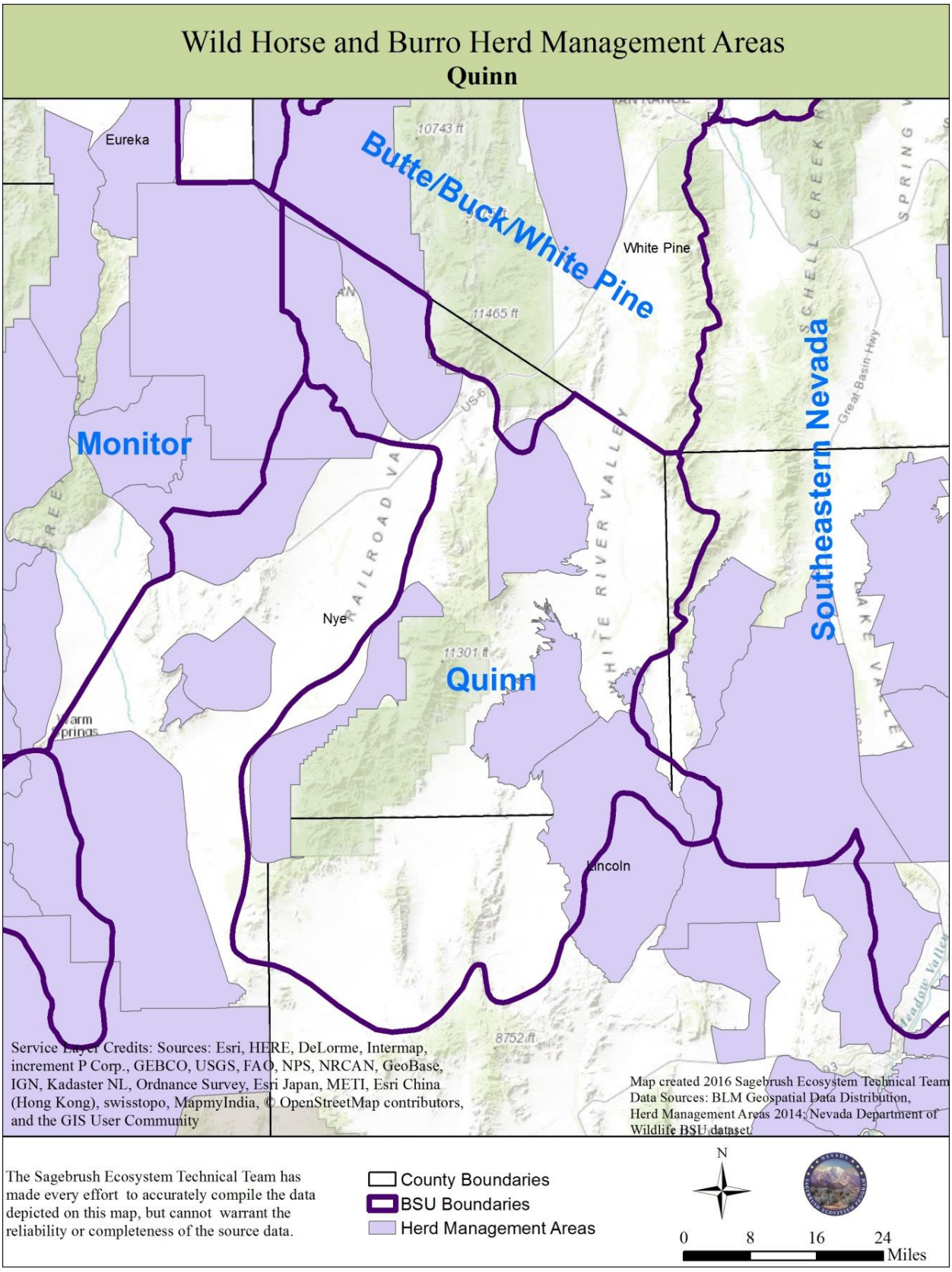
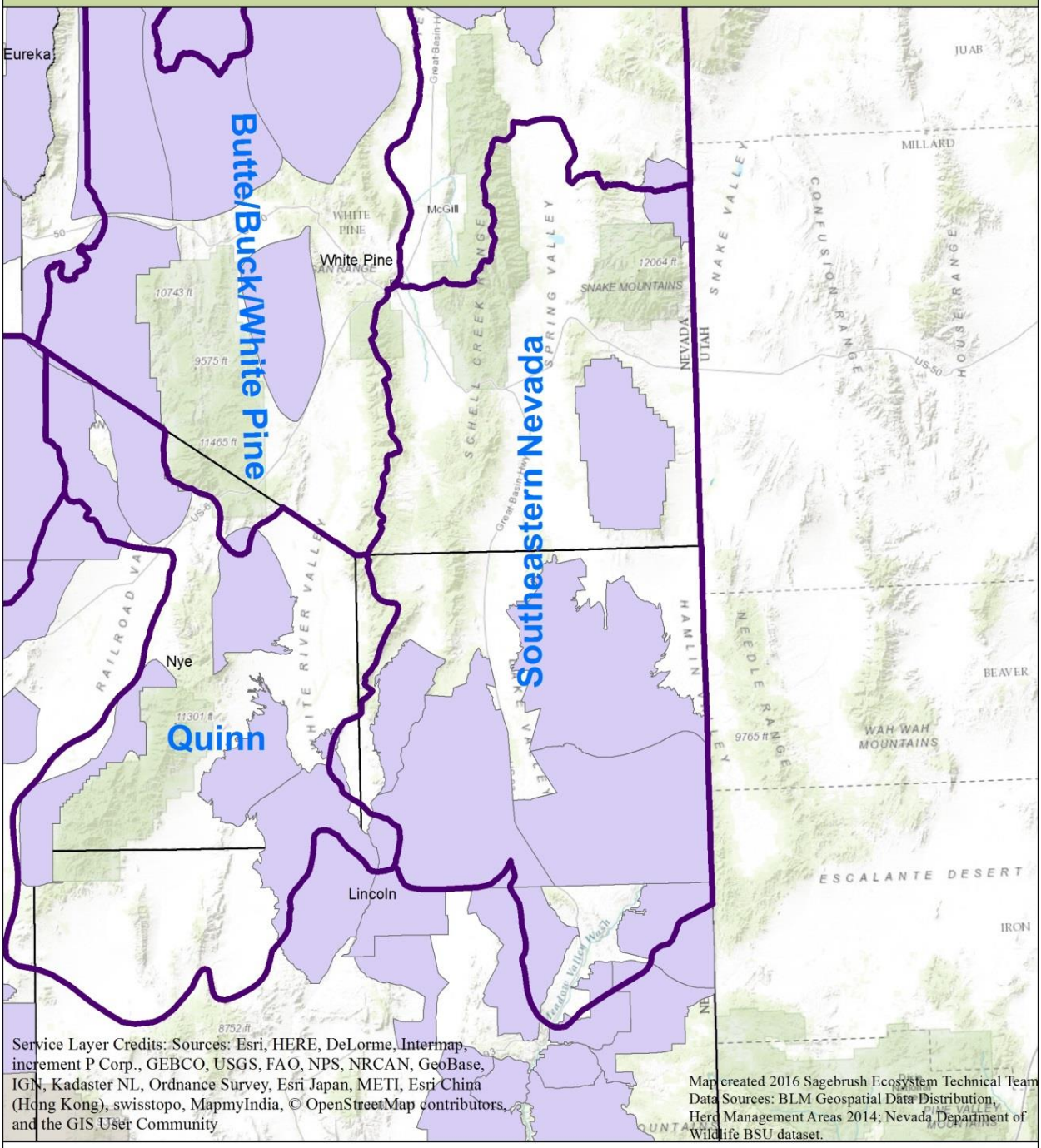
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 10 20 30
Miles

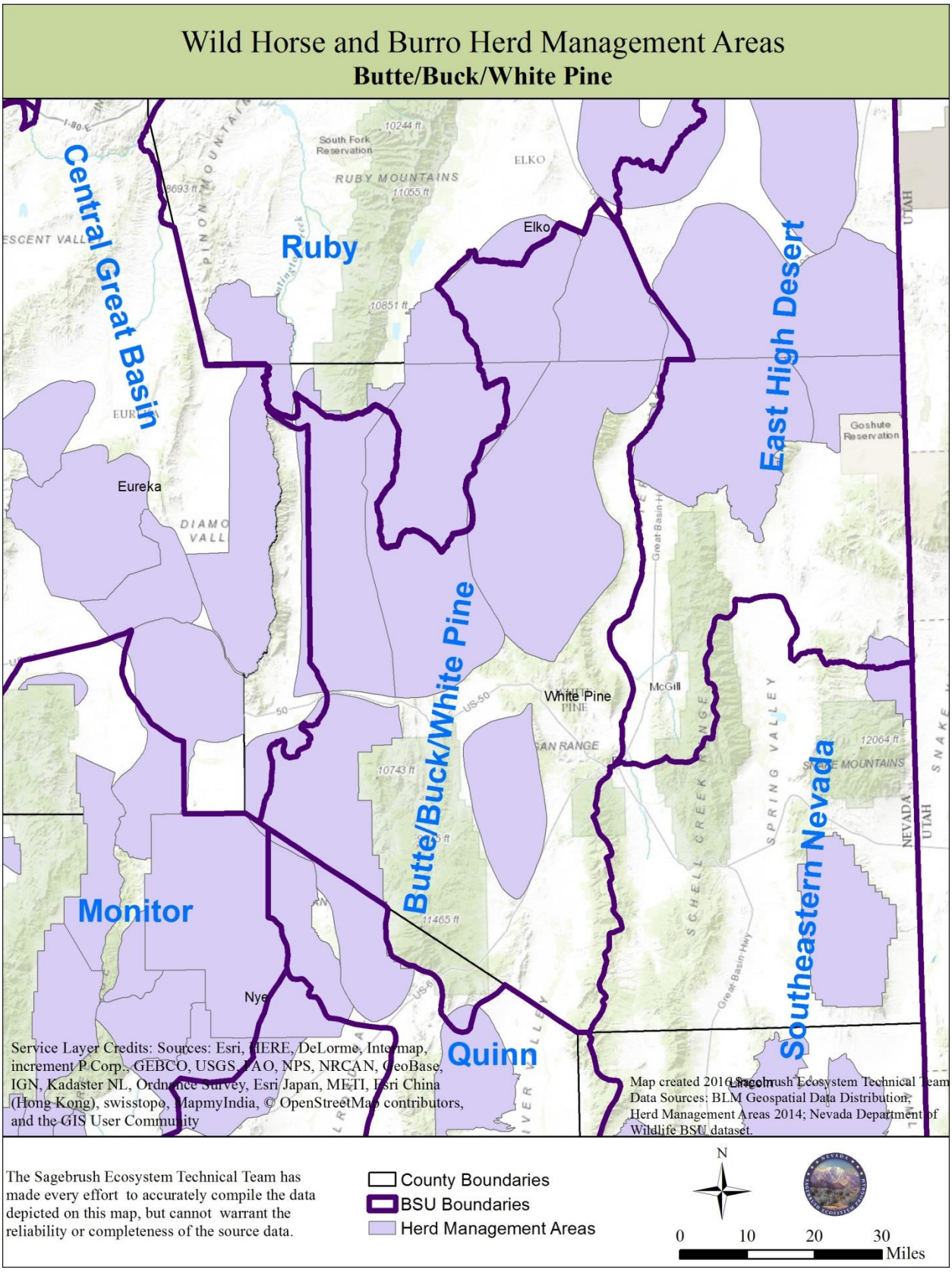

Wild Horse and Burro Herd Management Areas
Northeast Elko
2319 m
2147 m
1966 m
GOOSE CREEK MO
2614 m
2372 m
Northeast Elko
NEVADA
2390 m
Elko
O'Neil County Road
Central Elko
UTAH
1519 m
TECOMA VALLEY
East High Desert
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 4 8 12
Miles


Wild Horse and Burro Herd Management Areas
Northeast Elko
2319 m
2147 m
1966 m
GOOSE CREEK MC
2614 m
2372 m
Northeast Elko
2390 m
Elko
NEVADA
UTAH
O'Neil County Road
Central Elko
1519 m
East High Desert
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 4 8 12
Miles

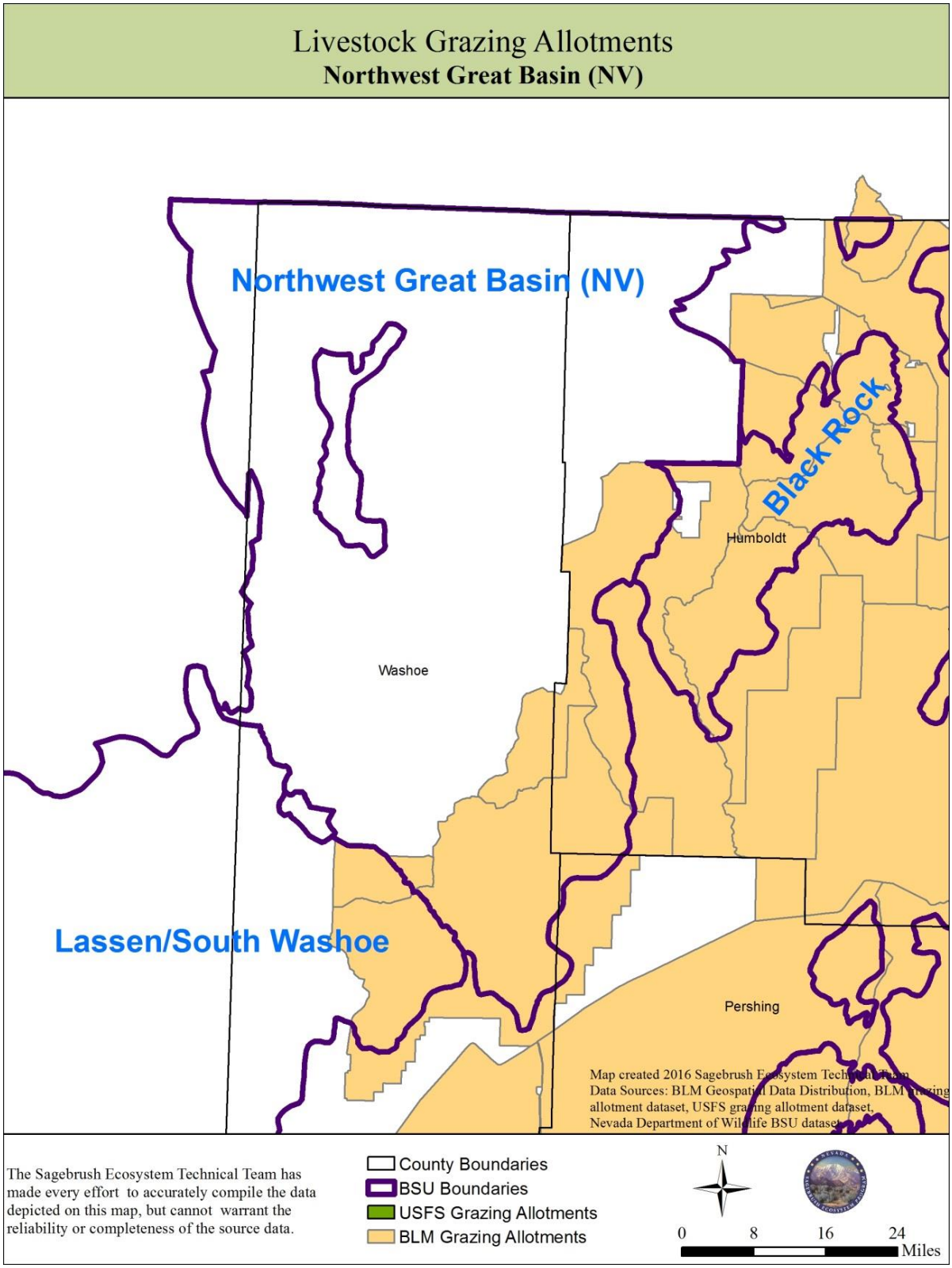

Wild Horse and Burro Herd Management Areas
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Southeastern Nevada
Nye
Quinn
Lincoln
10743 ft
11465 ft
11301 ft
8752 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 8 16 24
Miles

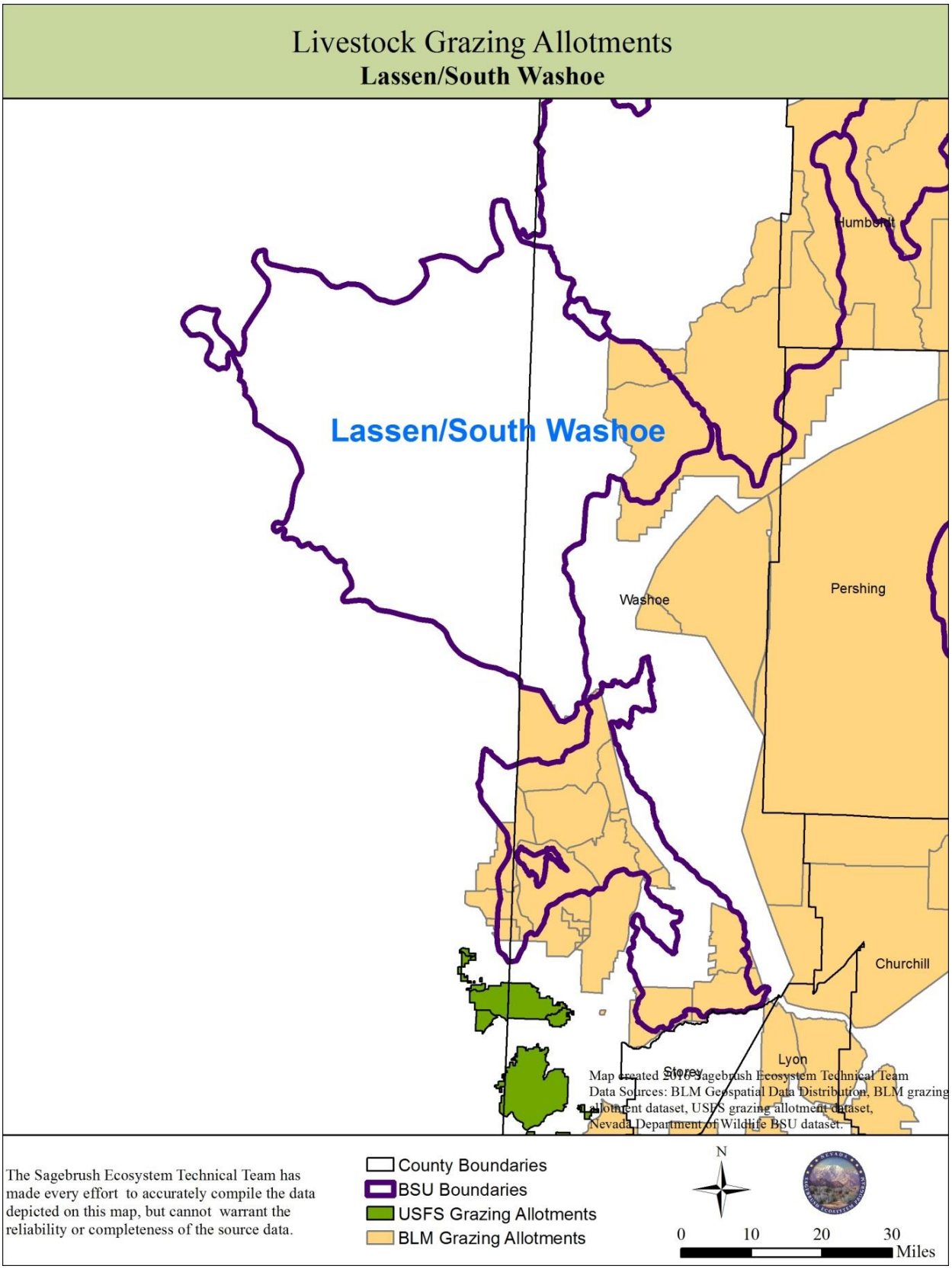
Wild Horse and Burro Herd Management Areas
Southeastern Nevada

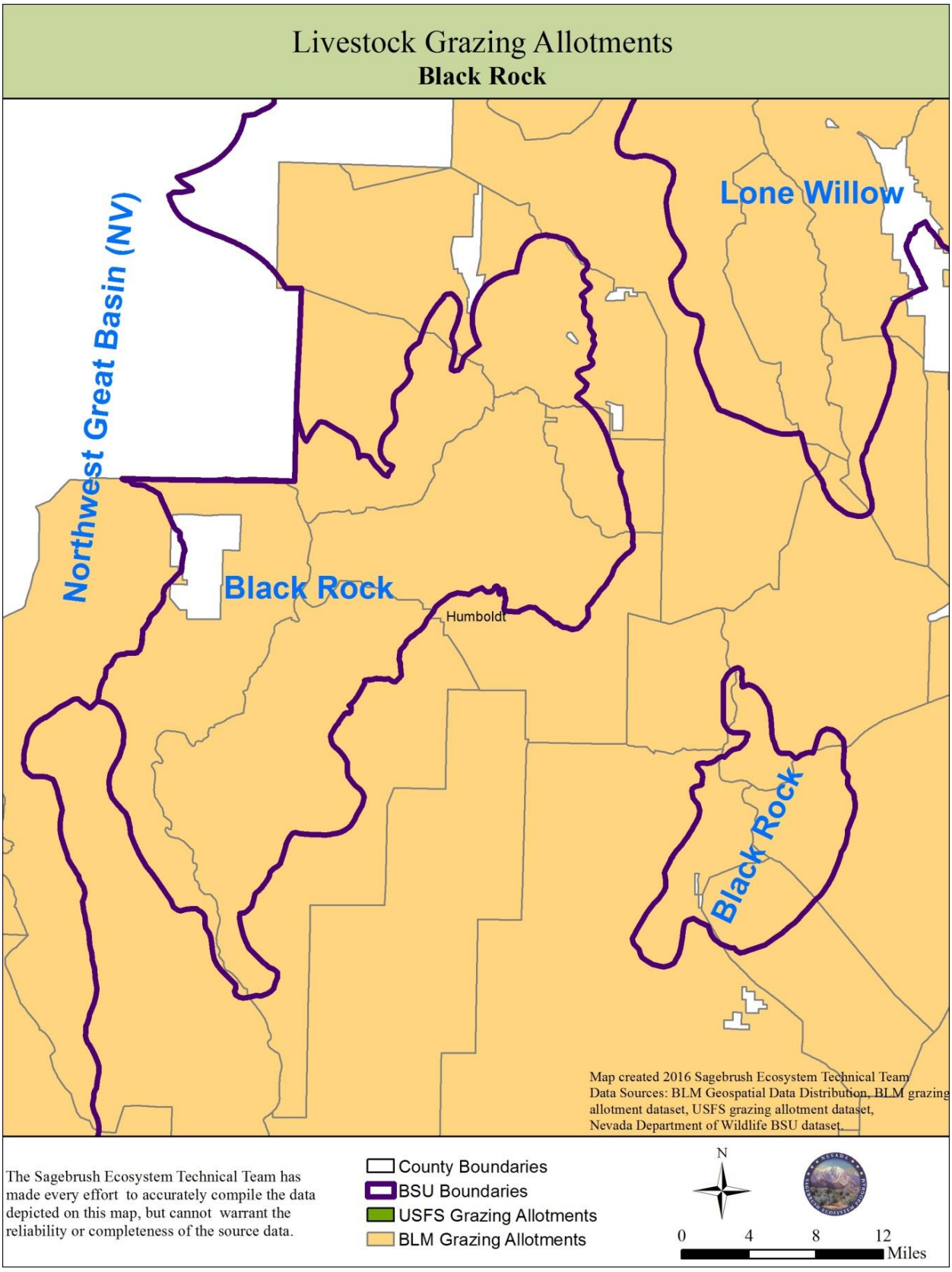



Wild Horse and Burro Herd Management Areas
Butte/Buck/White Pine
Central Great Basin
Ruby
East High Desert
Butte/Buck/White Pine
Monitor
Quinn
Southeastern Nevada
Elko
Eureka
White Pine
McGill
Nye
Lincoln
Goshute Reservation
South Fork Reservation
RUBY MOUNTAINS
SPRING VALLEY
SCHELL CREEK RANGE
Great Basin Hwy
US-50
UTAH
NEVADA
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution: Herd Management Areas 2014; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Herd Management Areas
N
0 10 20 30
Miles

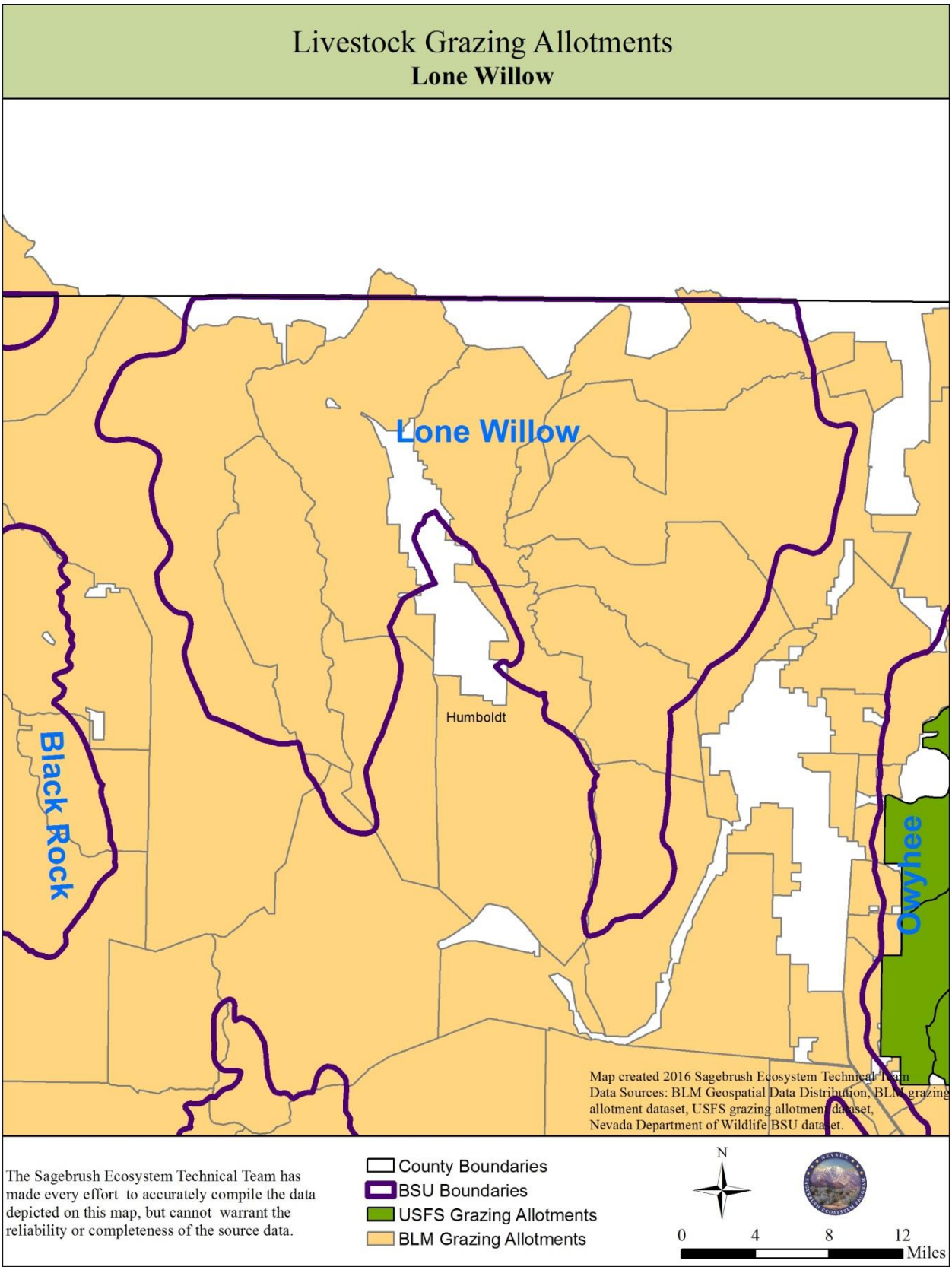
Appendix E. Livestock Grazing Allotments by BSU

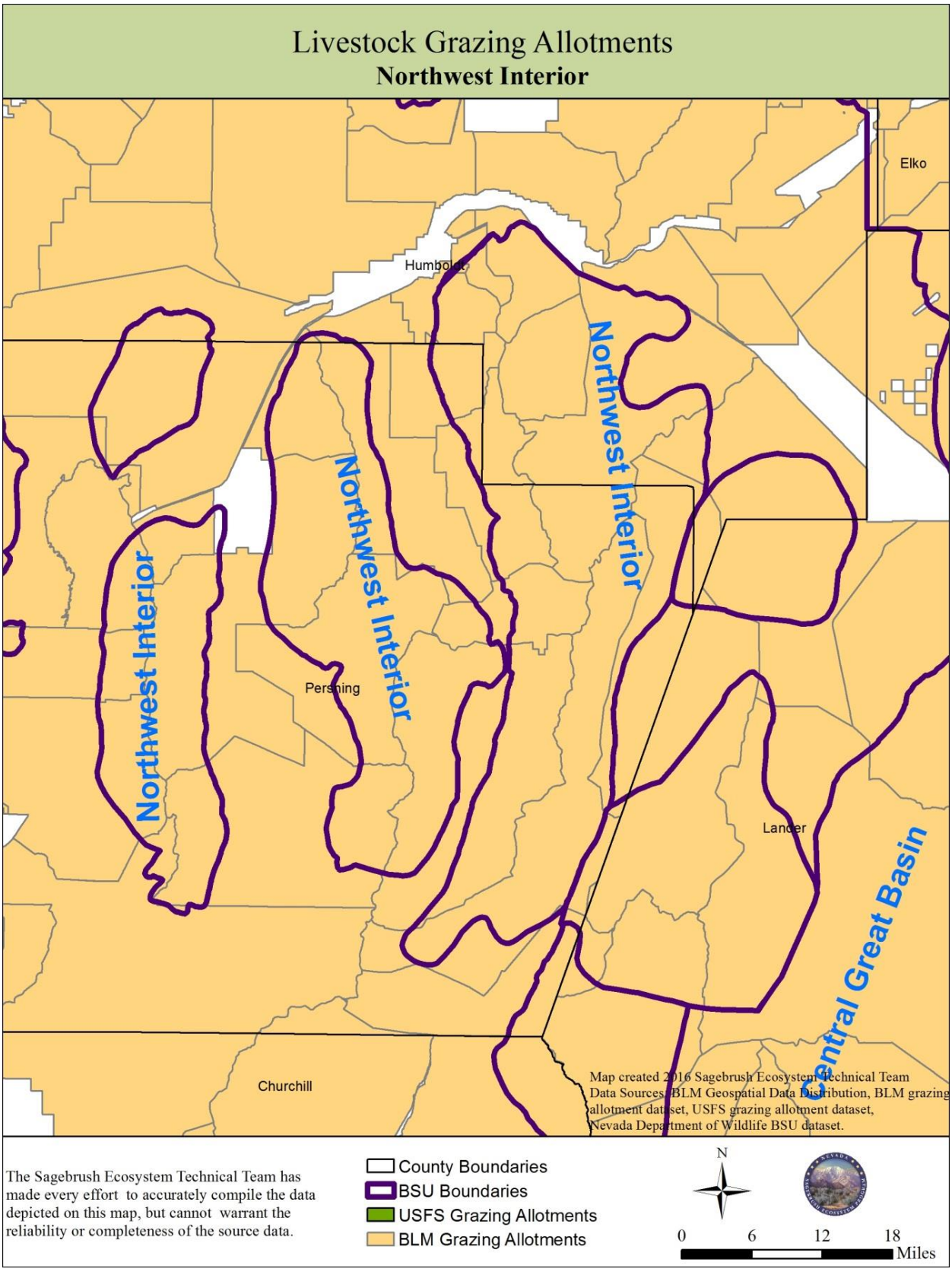



Livestock Grazing Allotments
Lassen/South Washoe
Lassen/South Washoe
Humboldt
Washoe
Pershing
Churchill
Storey
Lyon
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

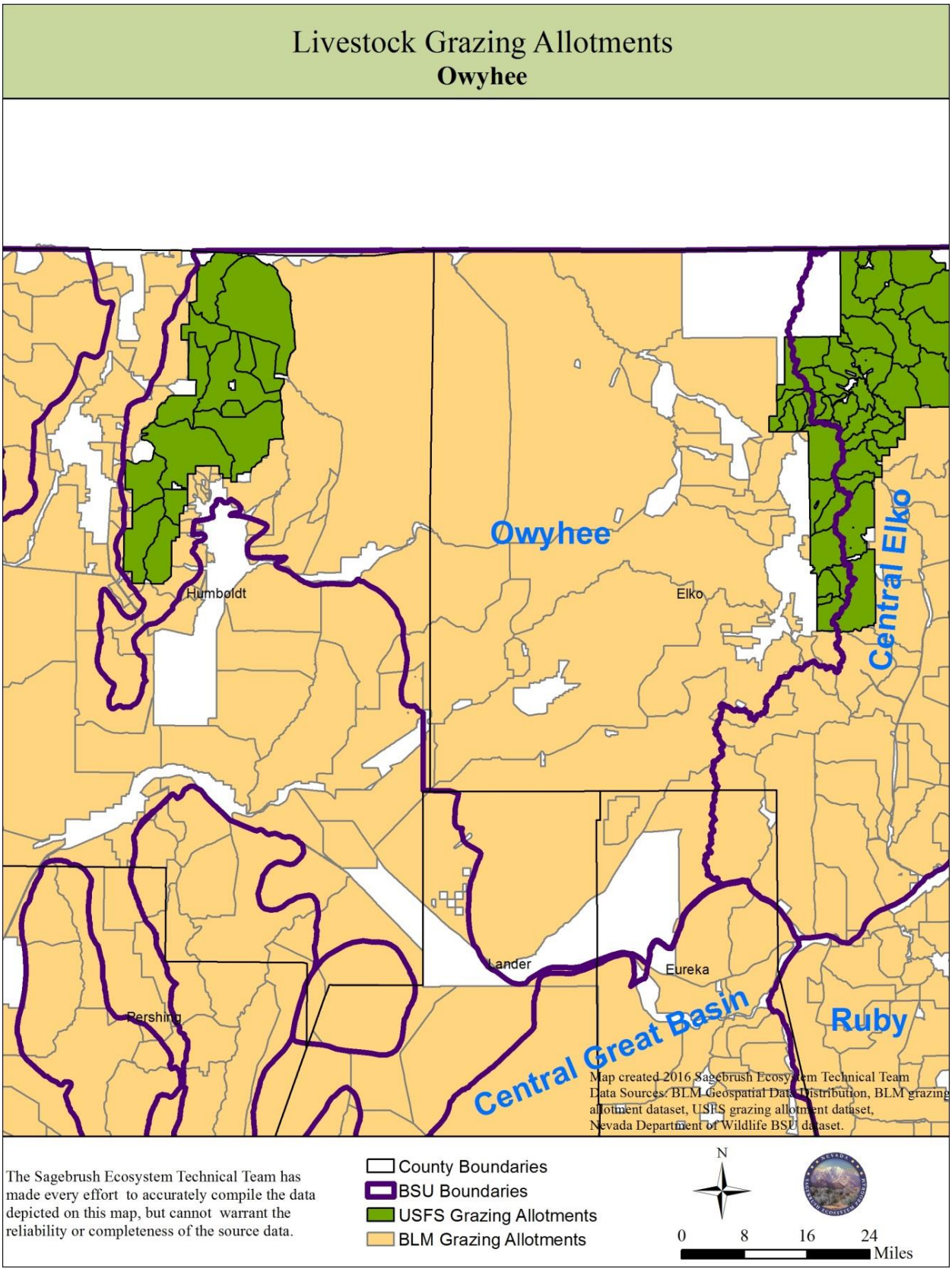

Livestock Grazing Allotments
Black Rock
Lone Willow
Northwest Great Basin (NV)
Black Rock
Humboldt
Black Rock
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0
4
8
12
Miles

DRAFT

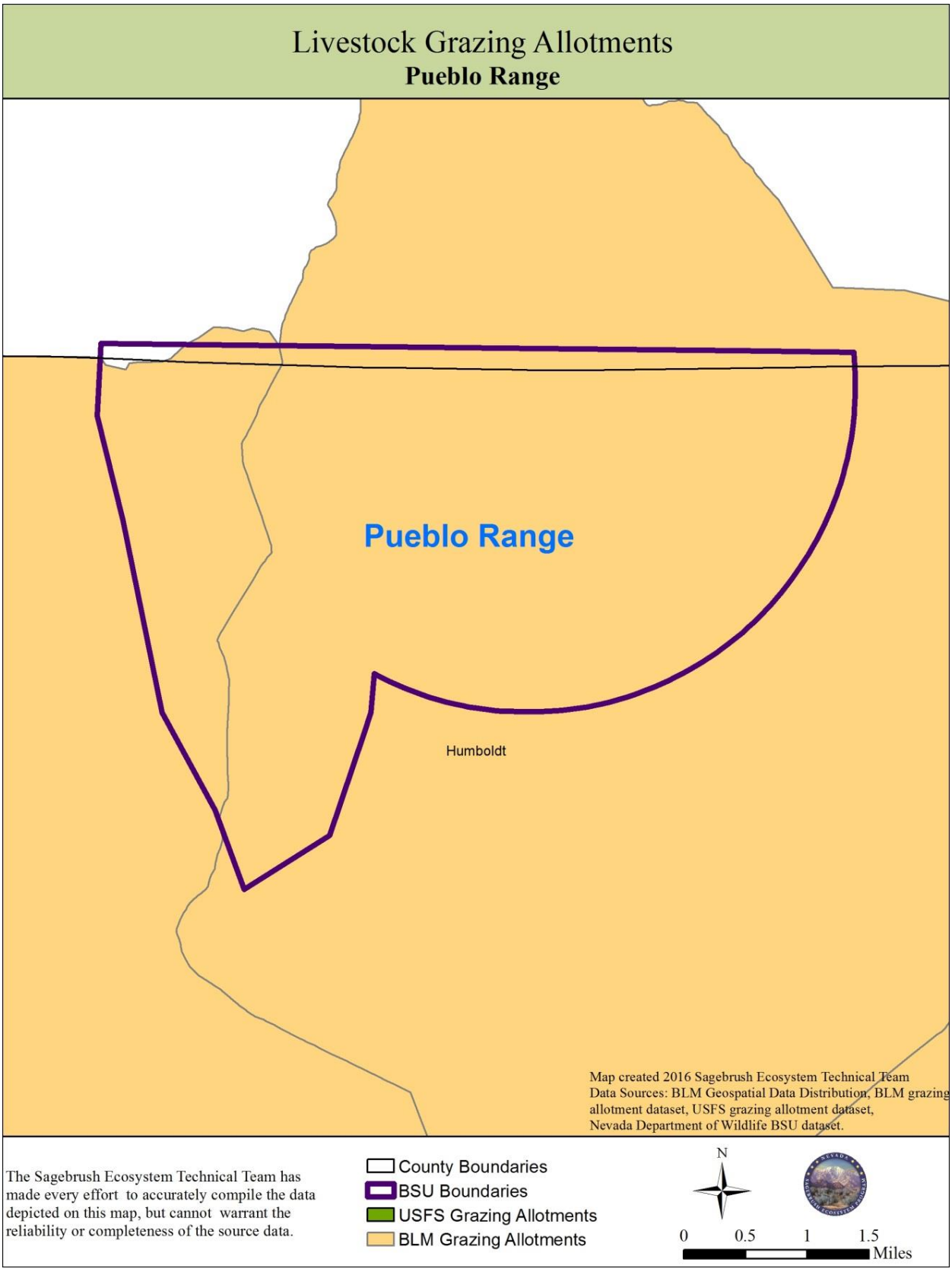

Livestock Grazing Allotments
Lone Willow
Lone Willow
Humboldt
Black Rock
Owyhee
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 4 8 12
Miles


Livestock Grazing Allotments
Northwest Interior
Elko
Humboldt
Northwest Interior
Northwest Interior
Northwest Interior
Pershing
Lander
Central Great Basin
Churchill
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 6 12 18
Miles

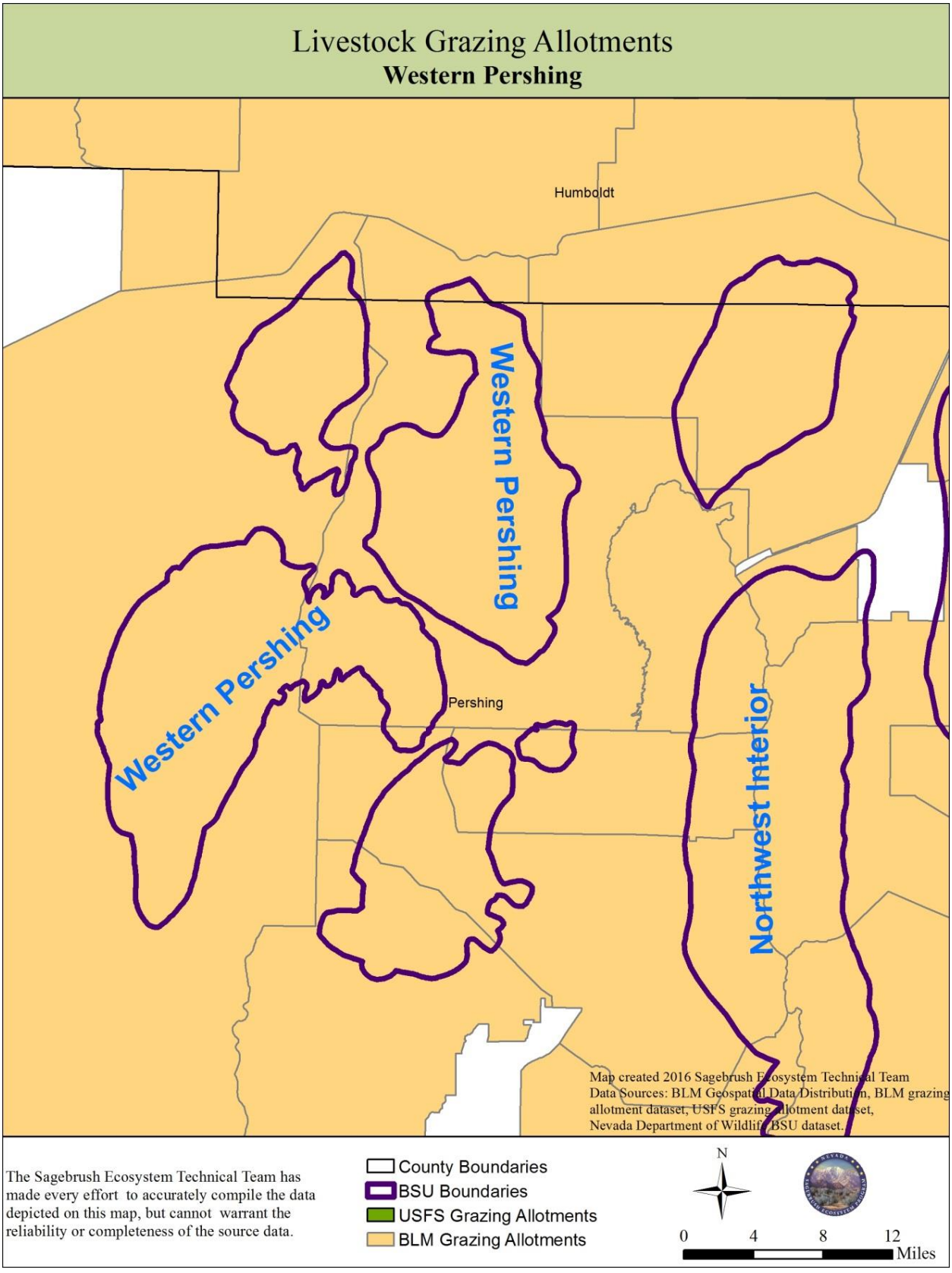
DRAFT

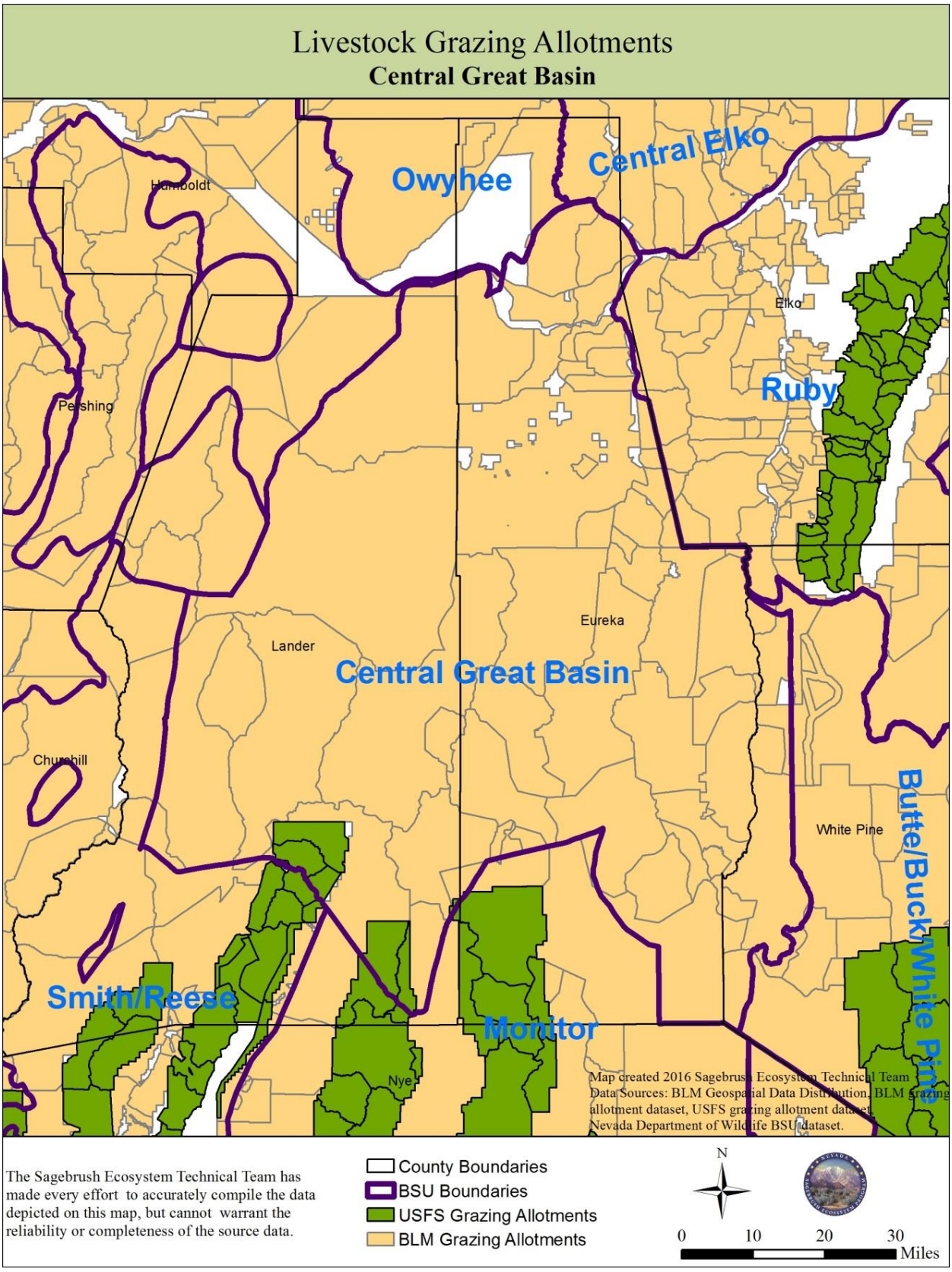

Livestock Grazing Allotments
Owyhee
Owyhee
Humboldt
Elko
Central Elko
Lander
Eureka
Pershing
Central Great Basin
Ruby
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 8 16 24
Miles

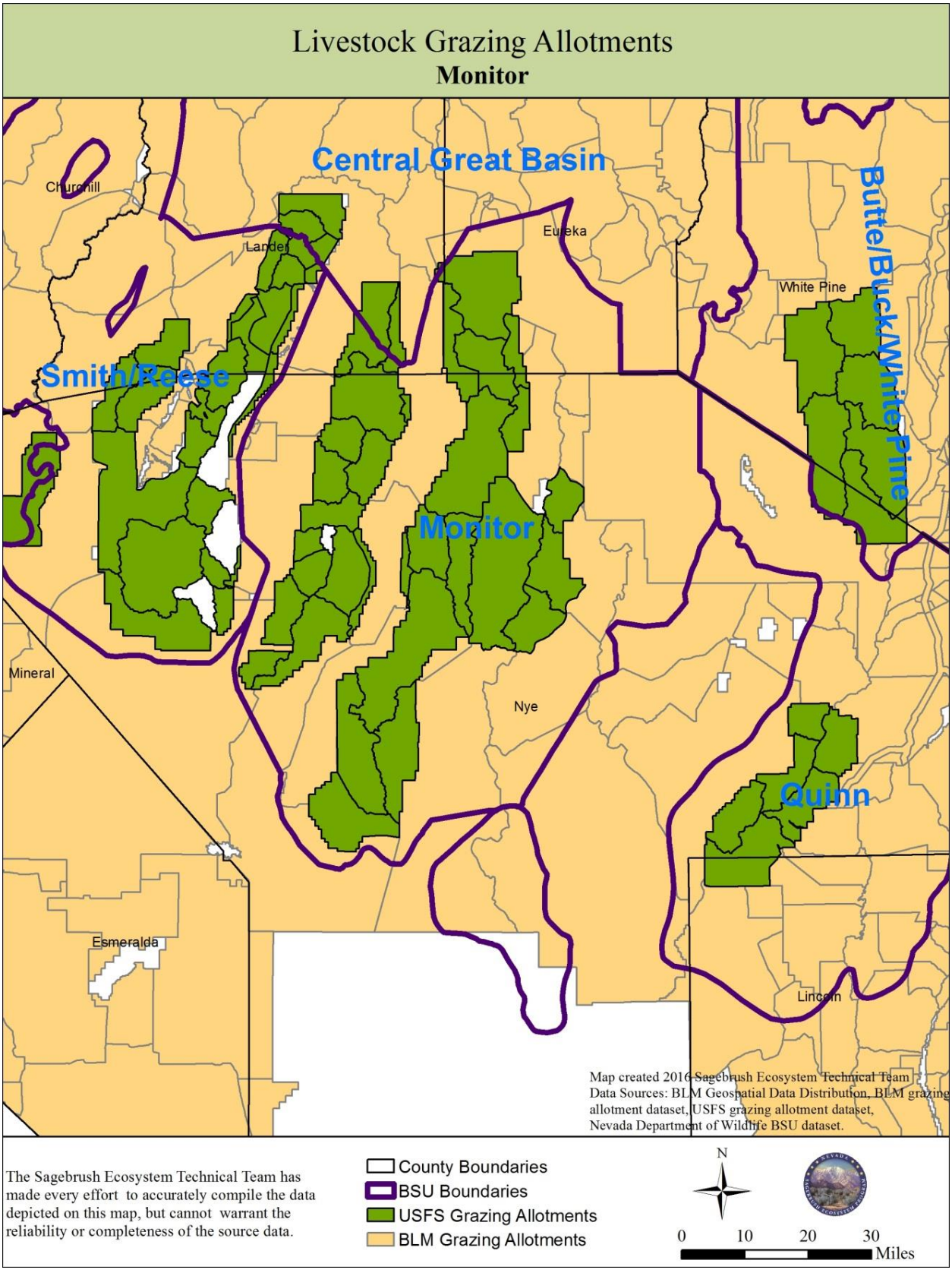
DRAFT


Livestock Grazing Allotments
Pueblo Range
Pueblo Range
Humboldt
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 0.5 1 1.5
Miles

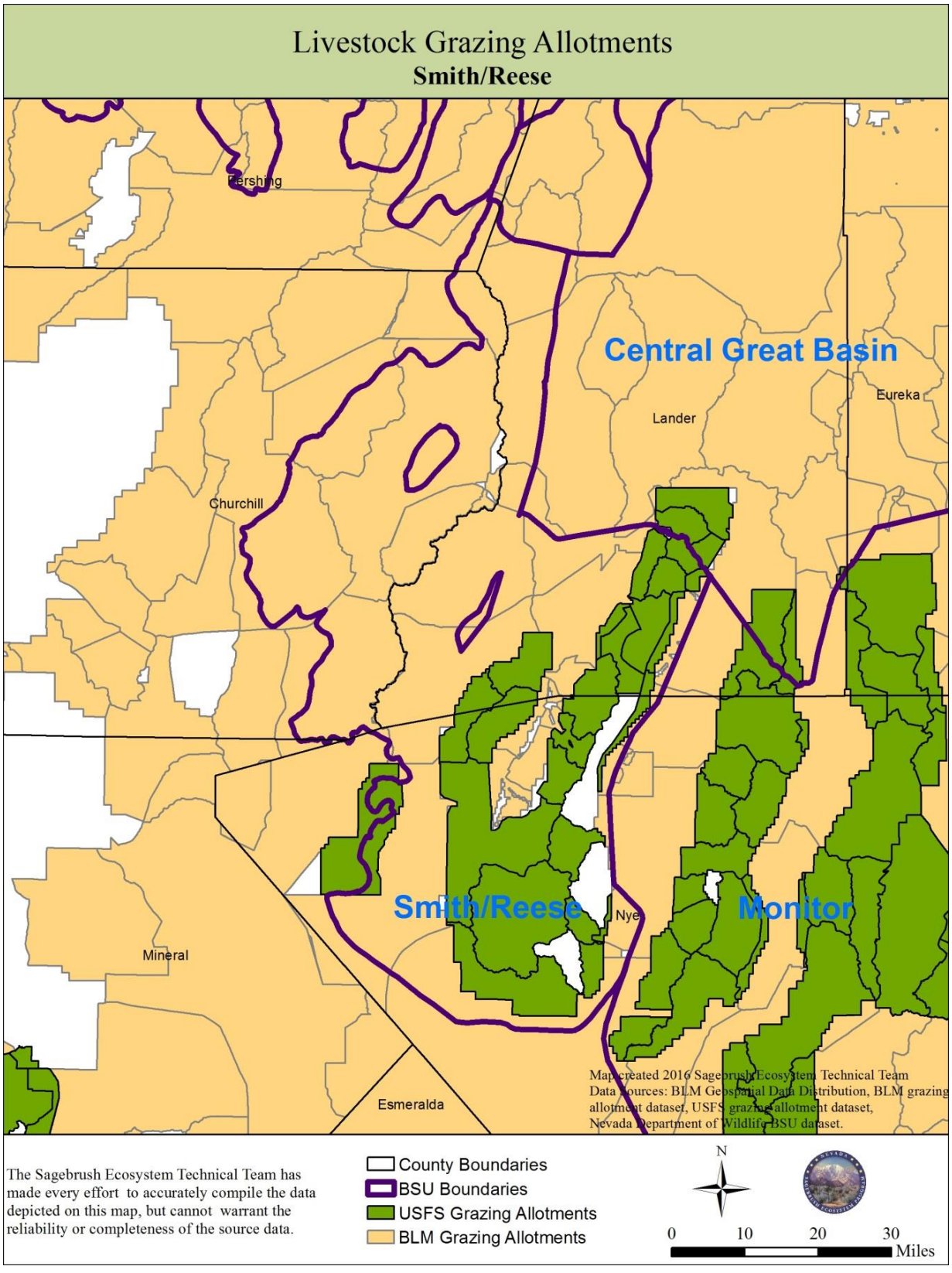
DRAFT


Livestock Grazing Allotments
Western Pershing
Humboldt
Western Pershing
Western Pershing
Pershing
Northwest Interior
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0
4
8
12
Miles

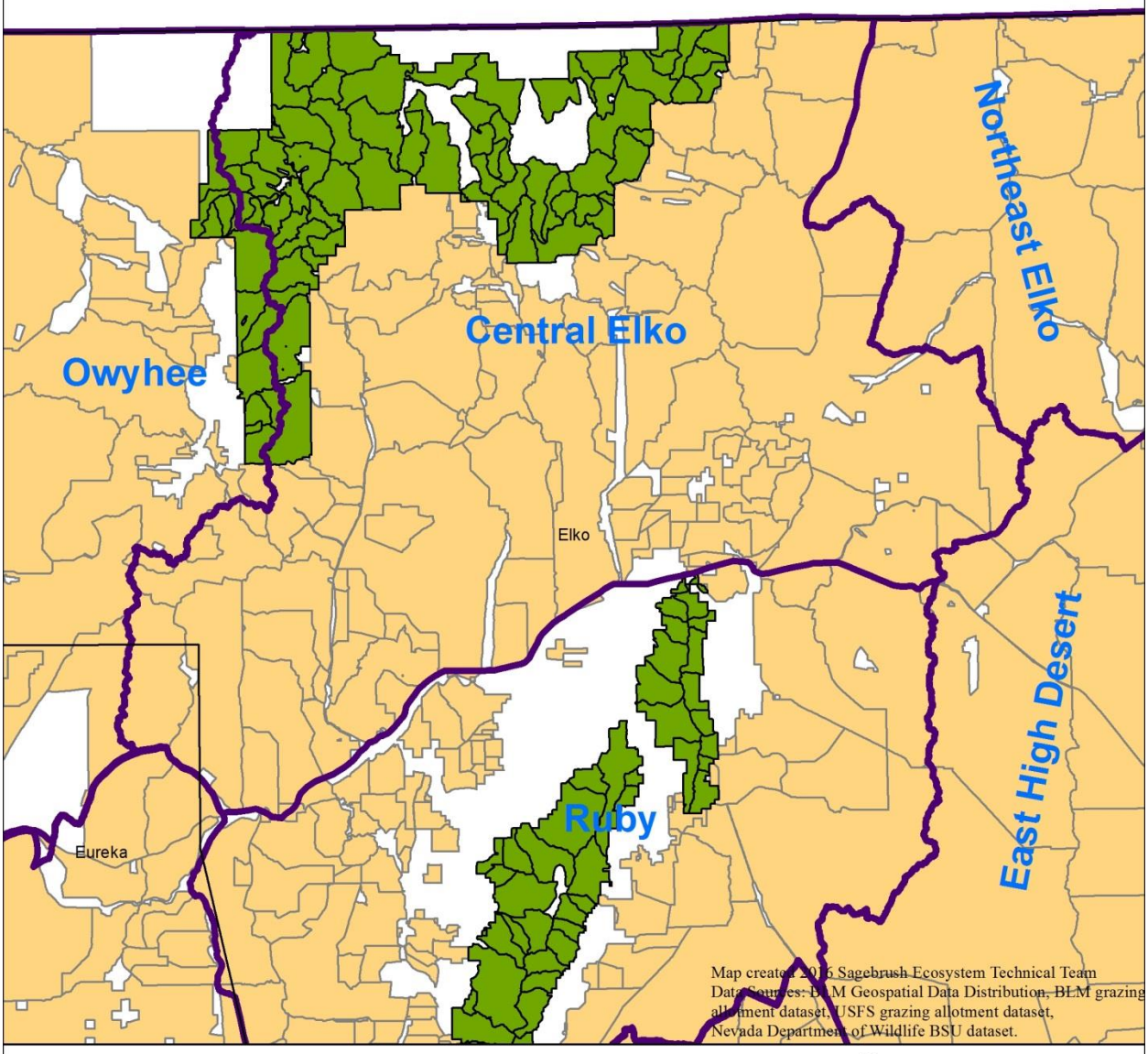

Livestock Grazing Allotments
Central Great Basin
Owyhee
Central Elko
Humboldt
Elko
Ruby
Pershing
Eureka
Lander
Central Great Basin
Churchill
White Pine
Butte/Buck/White Pine
Smith/Reese
Monitor
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles


Livestock Grazing Allotments
Monitor
Central Great Basin
Churchill
Lander
Eureka
White Pine
Butte/Buck/White Pine
Smith/Reese
Monitor
Mineral
Nye
Quinn
Esmeralda
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

DRAFT


Livestock Grazing Allotments
Smith/Reese
Pershing
Central Great Basin
Eureka
Lander
Churchill
Smith/Reese
Nye
Monitor
Mineral
Esmeralda
Map created 2016 Sagebrush Ecosystem Technical Team
Data sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

Livestock Grazing Allotments
Central Elko



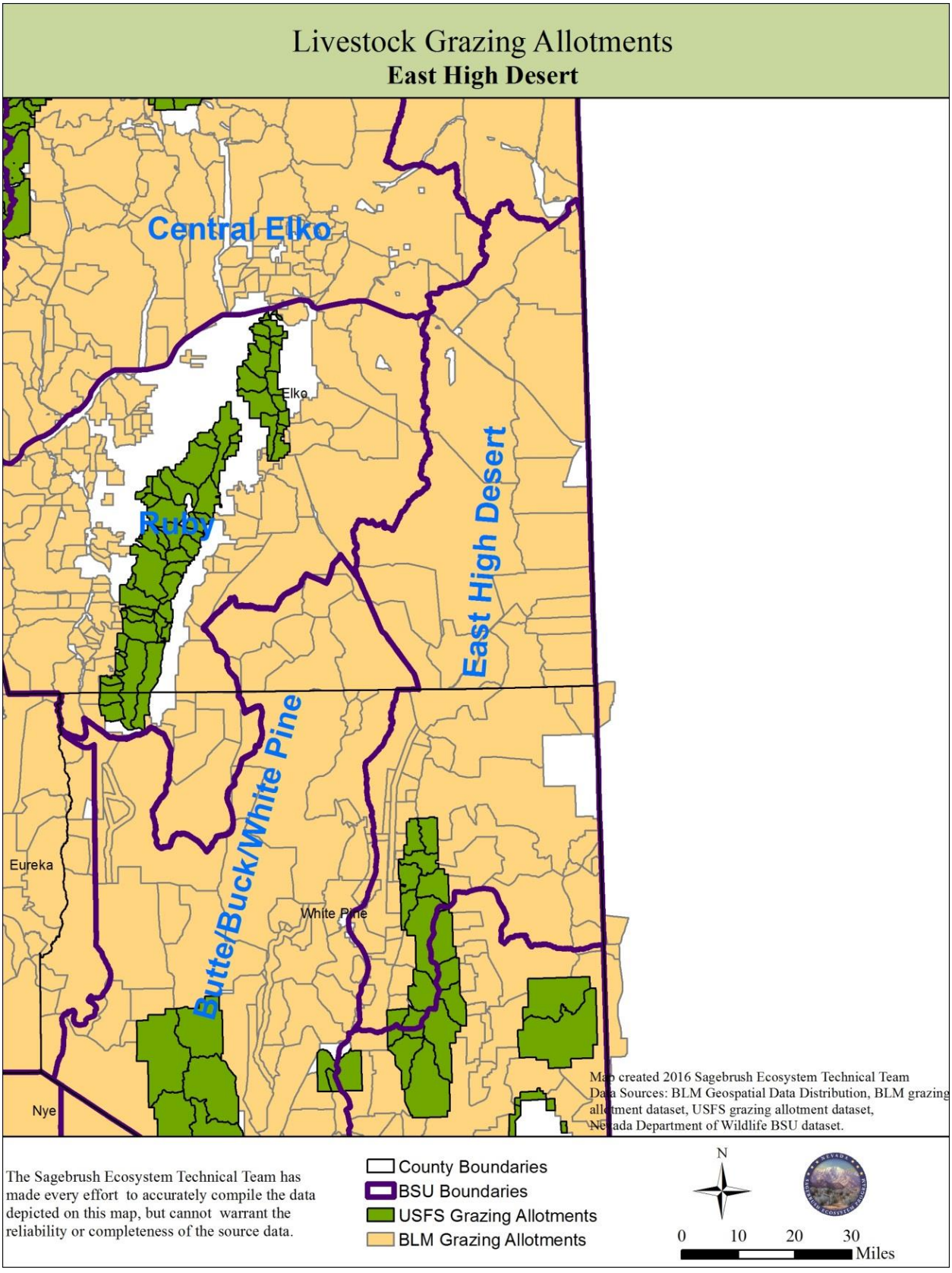
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.

County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments

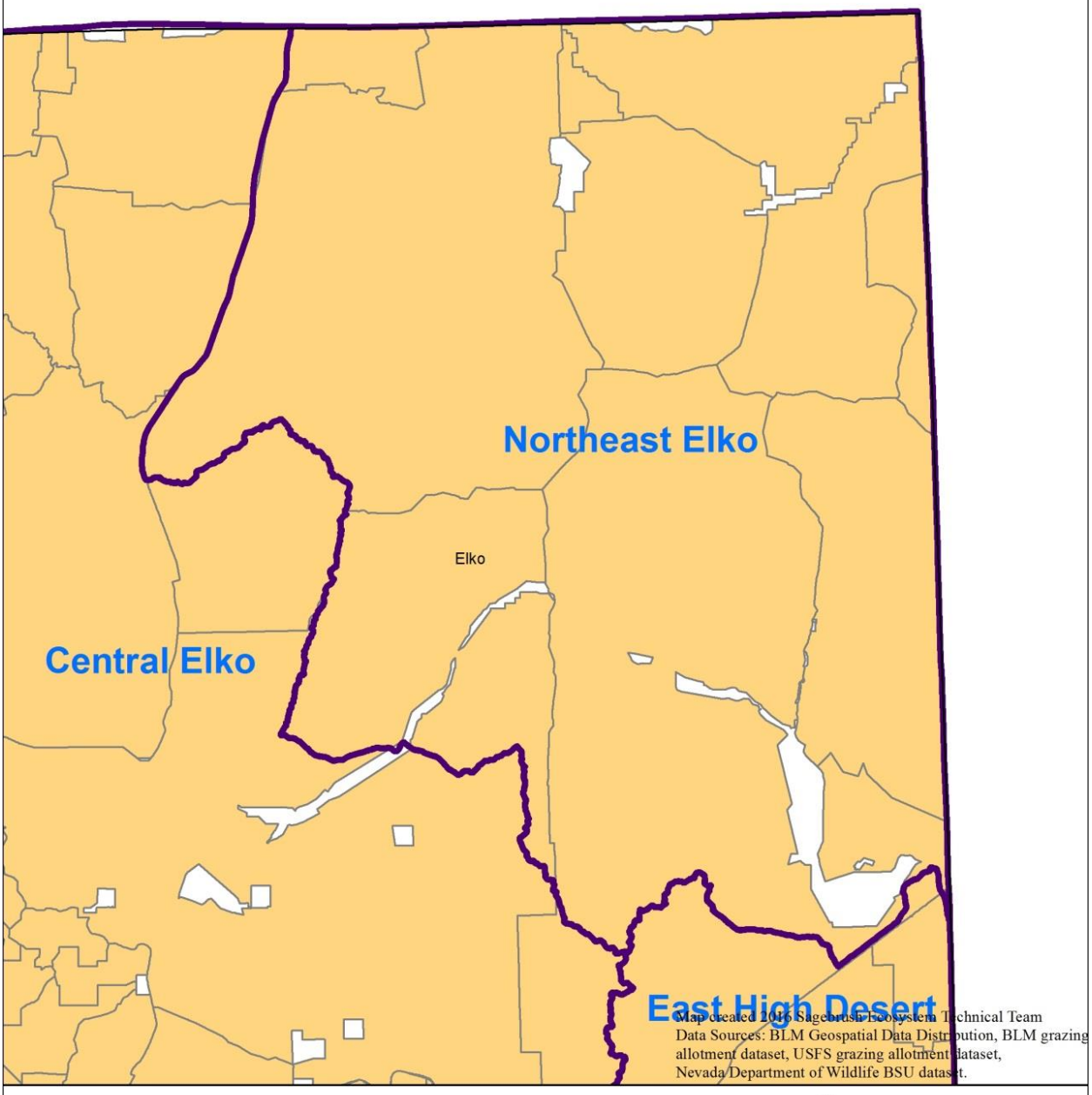
N

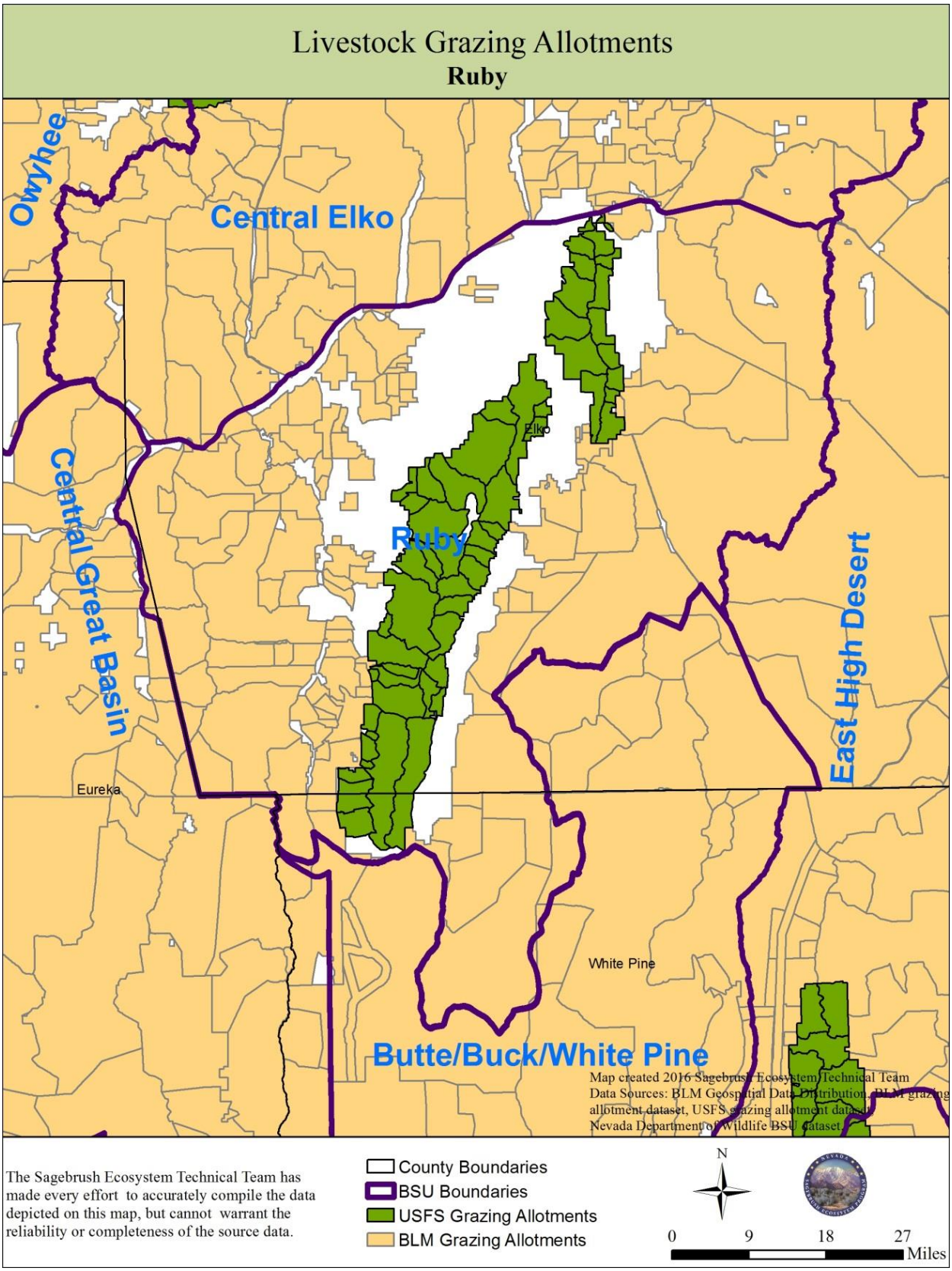
0 10 20 30 Miles

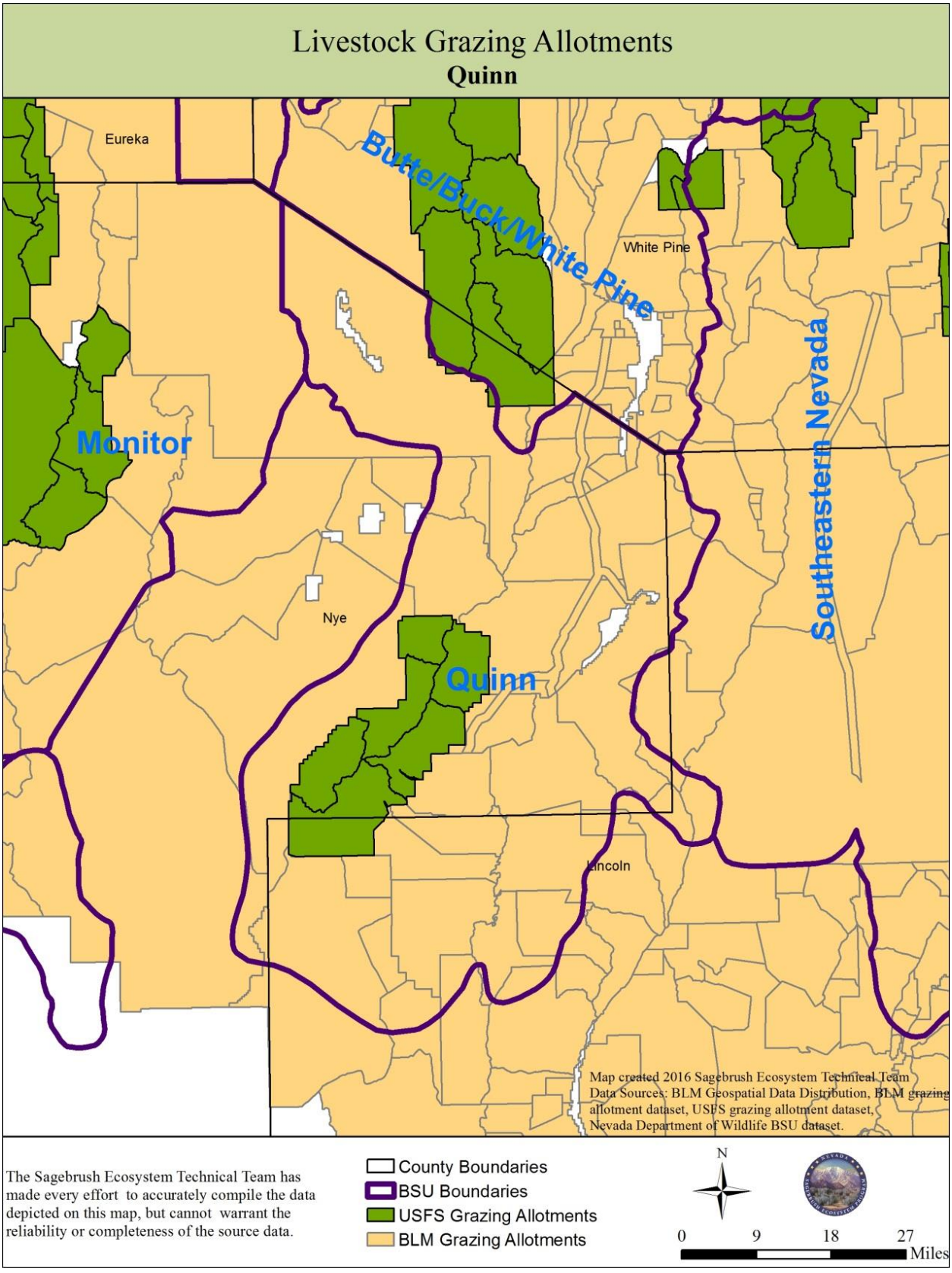
DRAFT

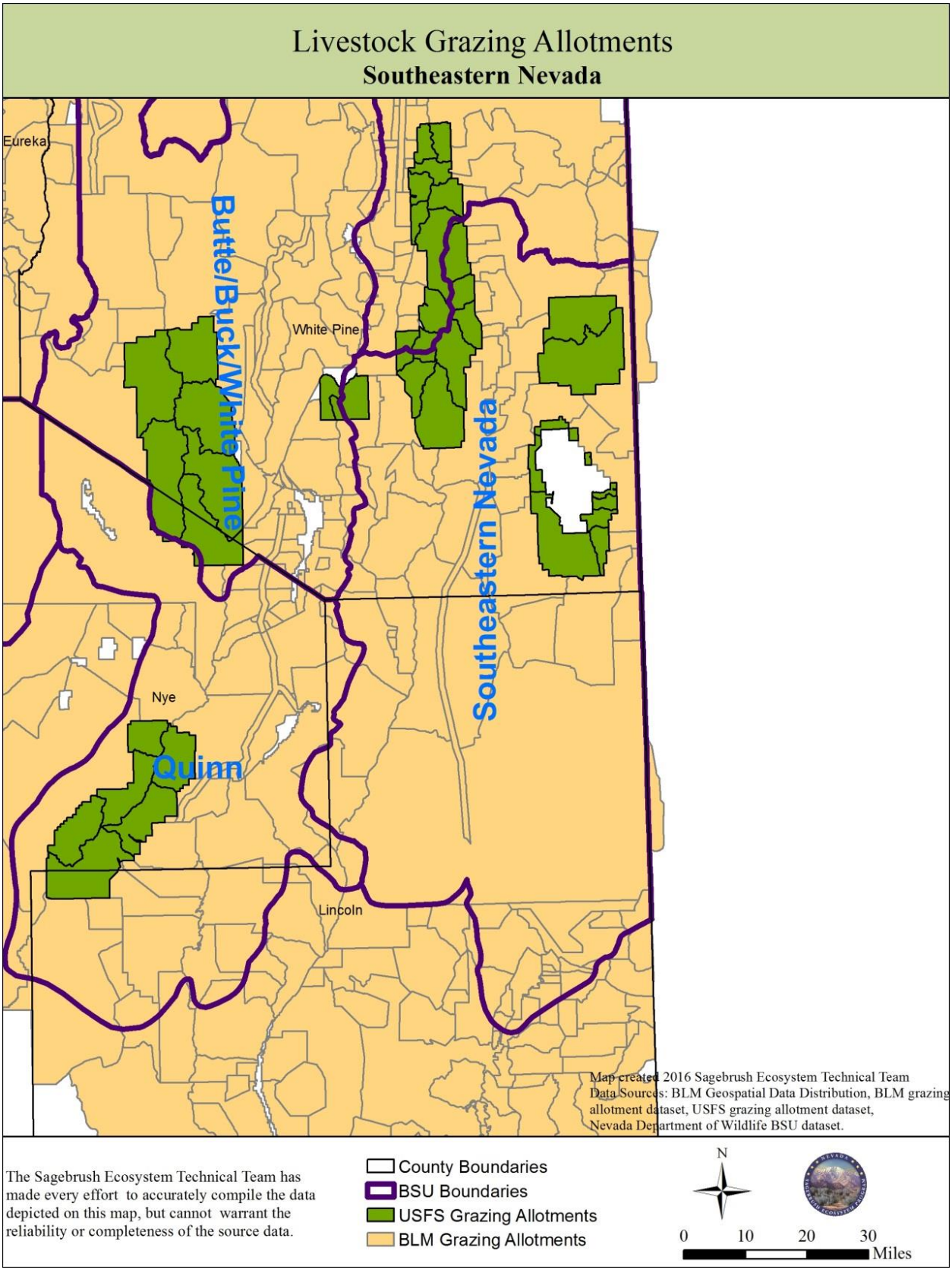

Livestock Grazing Allotments
East High Desert
Central Elko
Elko
Ruby
East High Desert
Butte/Buck/White Pine
White Pine
Eureka
Nye
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

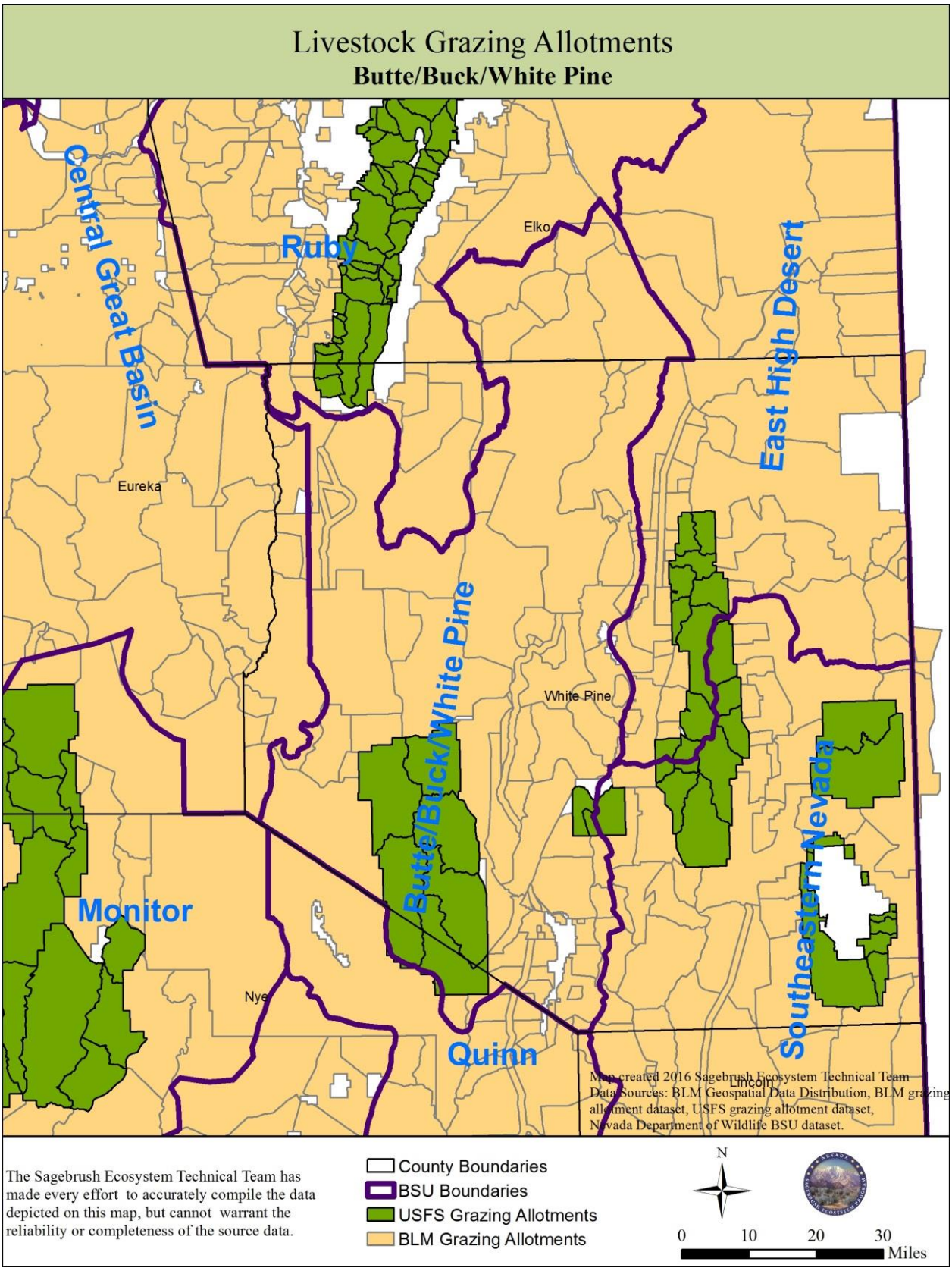
Livestock Grazing Allotments
Northeast Elko




Livestock Grazing Allotments
Ruby
Owyhee
Central Elko
Central Great Basin
Ruby
East High Desert
Elko
Eureka
White Pine
Butte/Buck/White Pine
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 9 18 27
Miles

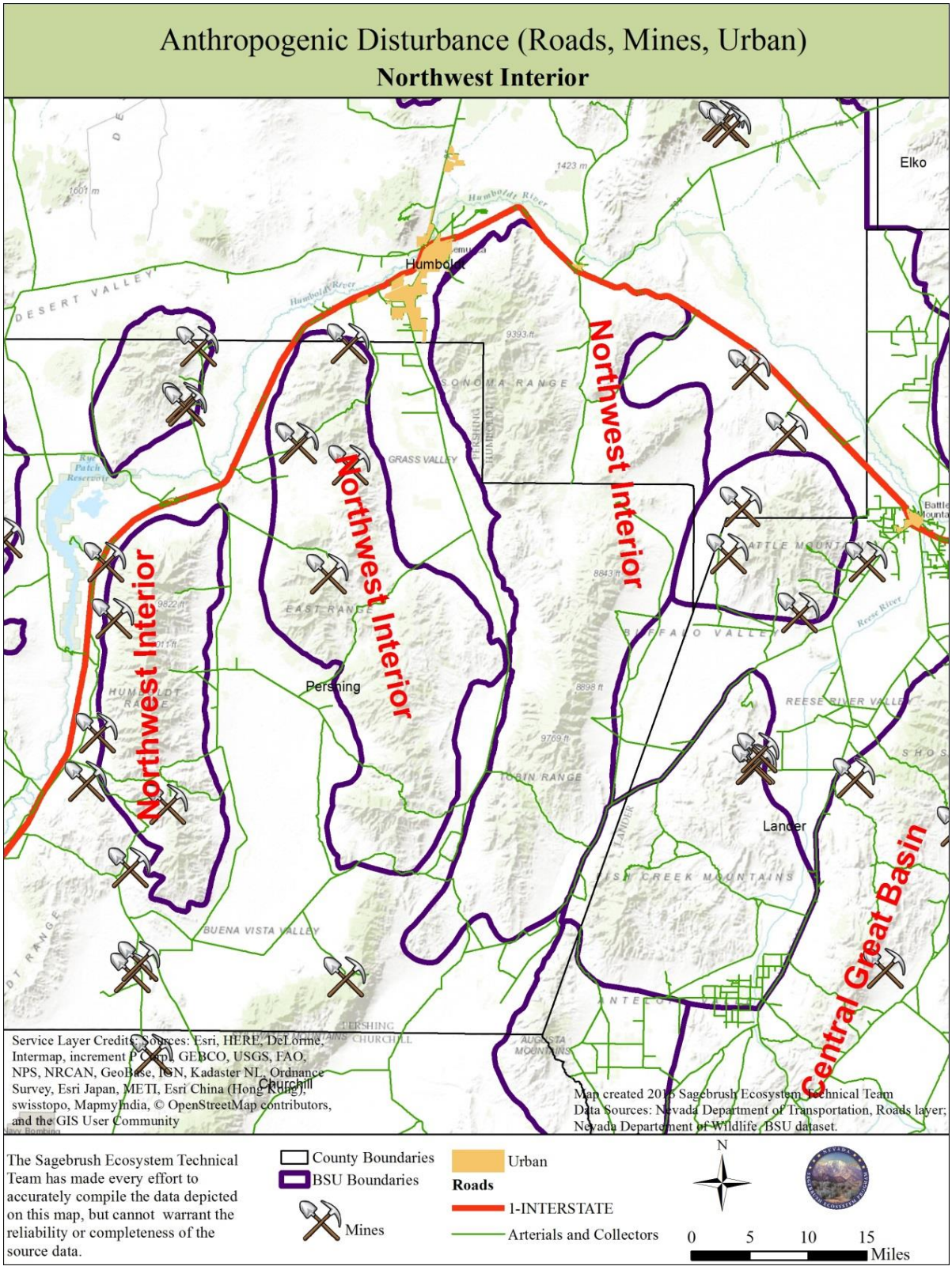

Livestock Grazing Allotments
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Southeastern Nevada
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 9 18 27
Miles

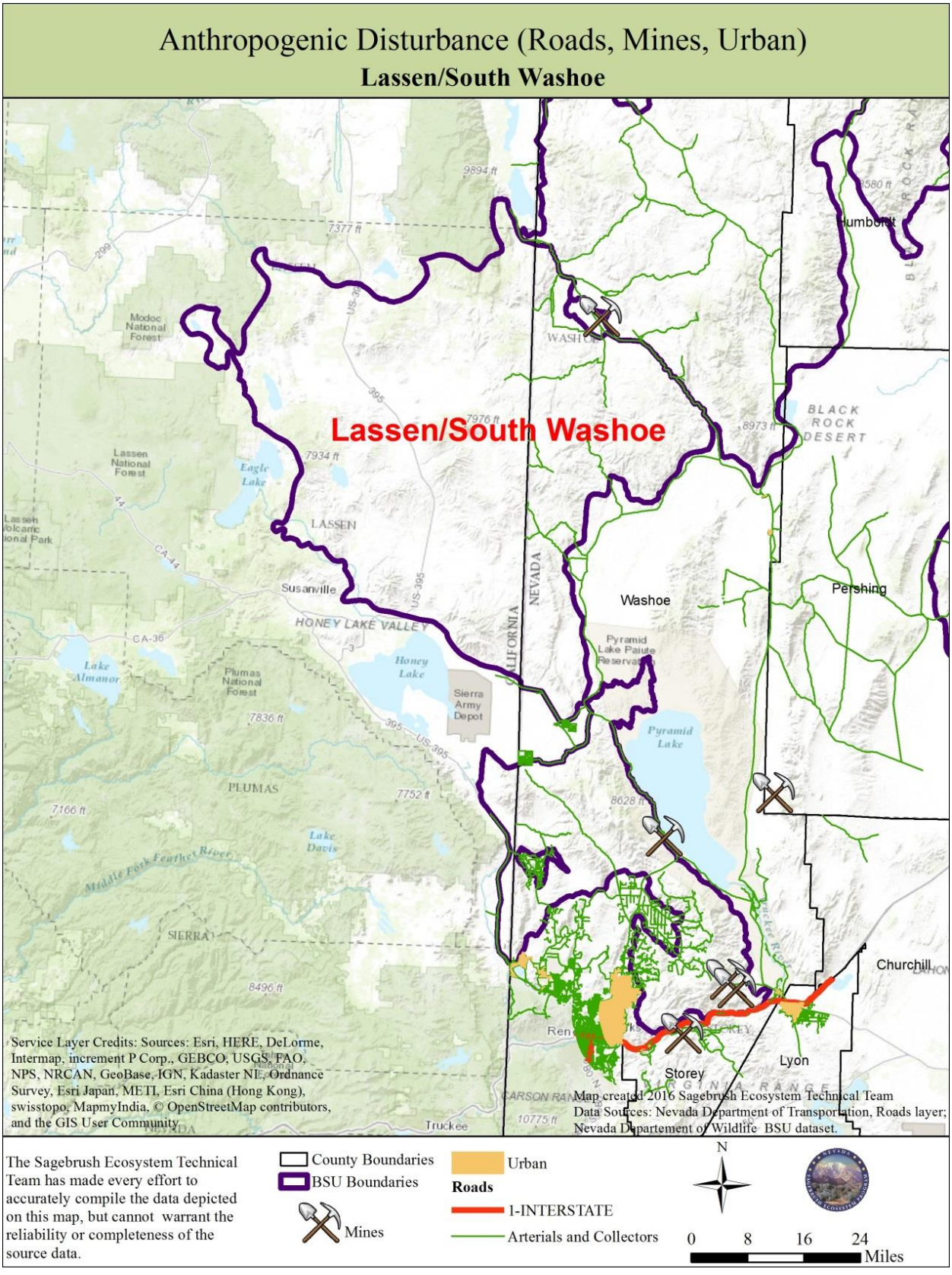

Livestock Grazing Allotments
Southeastern Nevada
Eureka
Butte/Buck/White Pine
White Pine
Southeastern Nevada
Nye
Quinn
Lincoln
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

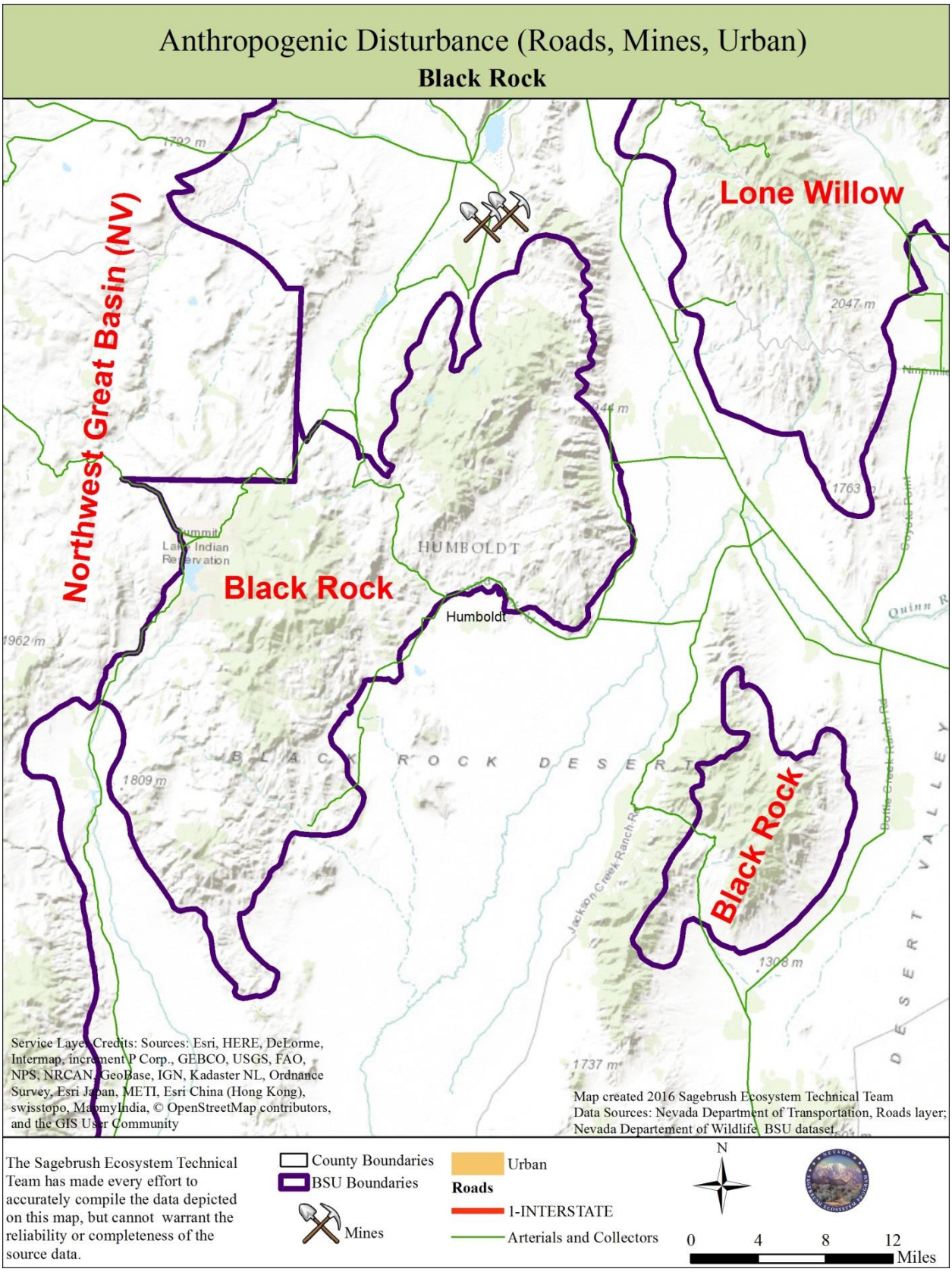

Livestock Grazing Allotments
Butte/Buck/White Pine
Central Great Basin
Ruby
Elko
East High Desert
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Nye
Quinn
Lincoln
Southeastern Nevada
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: BLM Geospatial Data Distribution, BLM grazing allotment dataset, USFS grazing allotment dataset, Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
USFS Grazing Allotments
BLM Grazing Allotments
N
0 10 20 30
Miles

DRAFT

Appendix F. Anthropogenic Disturbance (Roads, Mines, Urban) by BSU




Anthropogenic Disturbance (Roads, Mines, Urban)
Lassen/South Washoe
Lassen/South Washoe
Modoc National Forest
Lassen National Forest
Plumas National Forest
Lassen Volcanic National Park
Eagle Lake
Honey Lake
Lake Almanor
Lake Davis
Pyramid Lake
Pyramid Lake Paiute Reservation
Sierra Army Depot
Middle Fork Feather River
Susanville
HONEY LAKE VALLEY
LASSEN
PLUMAS
SIERRA
WASHOE
Washoe
Humboldt
Pershing
Churchill
Lyon
Storey
Truckee
CALIFORNIA
NEVADA
BLACK ROCK DESERT
CARSON RANGE
VIRGINIA RANGE
US-395
CA-44
CA-36
9894 ft
7377 ft
7976 ft
7934 ft
8973 ft
7836 ft
7752 ft
7166 ft
8628 ft
8496 ft
10775 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Roads layer; Nevada Department of Wildlife BSU dataset.
The Sagebrush Ecosystem Technical Team has made every effort to accurately compile the data depicted on this map, but cannot warrant the reliability or completeness of the source data.
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 8 16 24
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Black Rock
Northwest Great Basin (NV)
Lone Willow
Black Rock
Black Rock
Humboldt
HUMBOLDT
BLACK ROCK DESERT
DESERT VALLEY
Summit Lake Indian Reservation
Jackson Creek Ranch Rd
Quinn R
1962 m
1809 m
1737 m
1308 m
2047 m
1763
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
Data Sources: Nevada Department of Transportation, Roads layer; Nevada Departement of Wildlife, BSU dataset.
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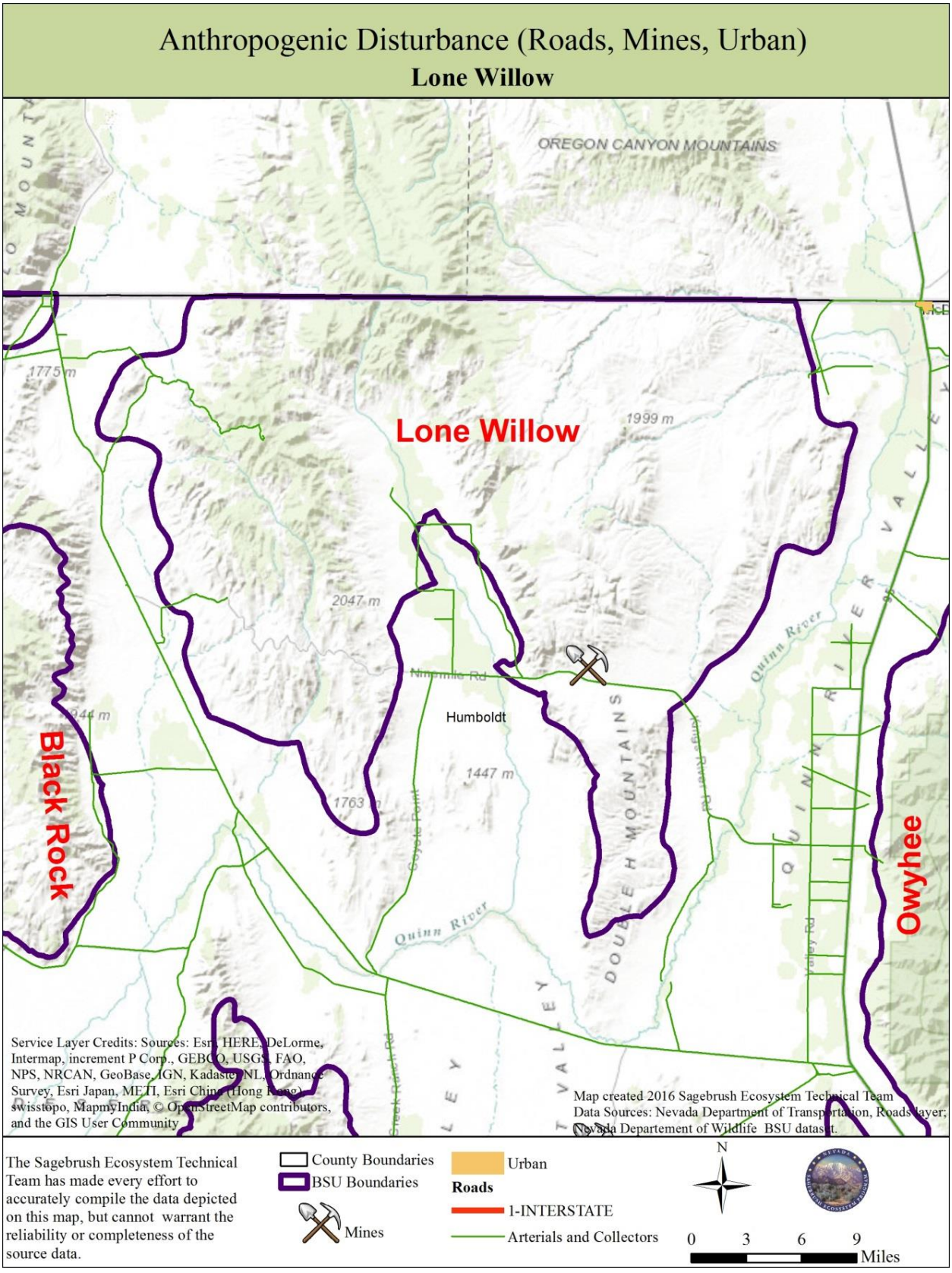
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 4 8 12
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Lone Willow
OREGON CANYON MOUNTAINS
Lone Willow
Black Rock
Owyhee
Humboldt
1775 m
1999 m
2047 m
1447 m
1763
Ninemile Rd
Quinn River
DOUBLE H MOUNTAINS
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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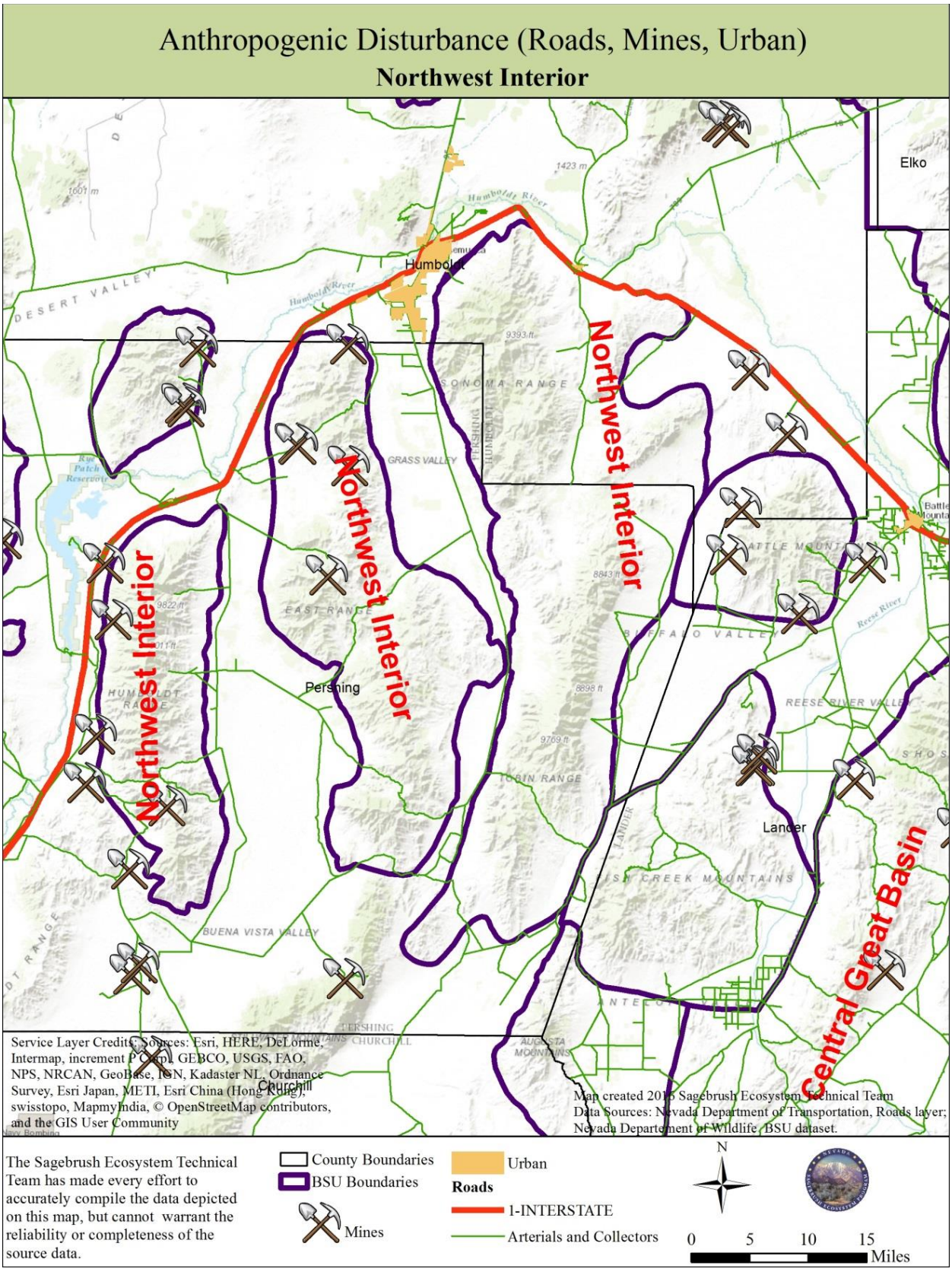
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 3 6 9
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Northwest Interior
Elko
Humboldt
Northwest Interior
Northwest Interior
Northwest Interior
Central Great Basin
Pershing
Lander
Churchill
DESERT VALLEY
SONOMA RANGE
GRASS VALLEY
BUFFALO VALLEY
REESE RIVER VALLEY
BUENA VISTA VALLEY
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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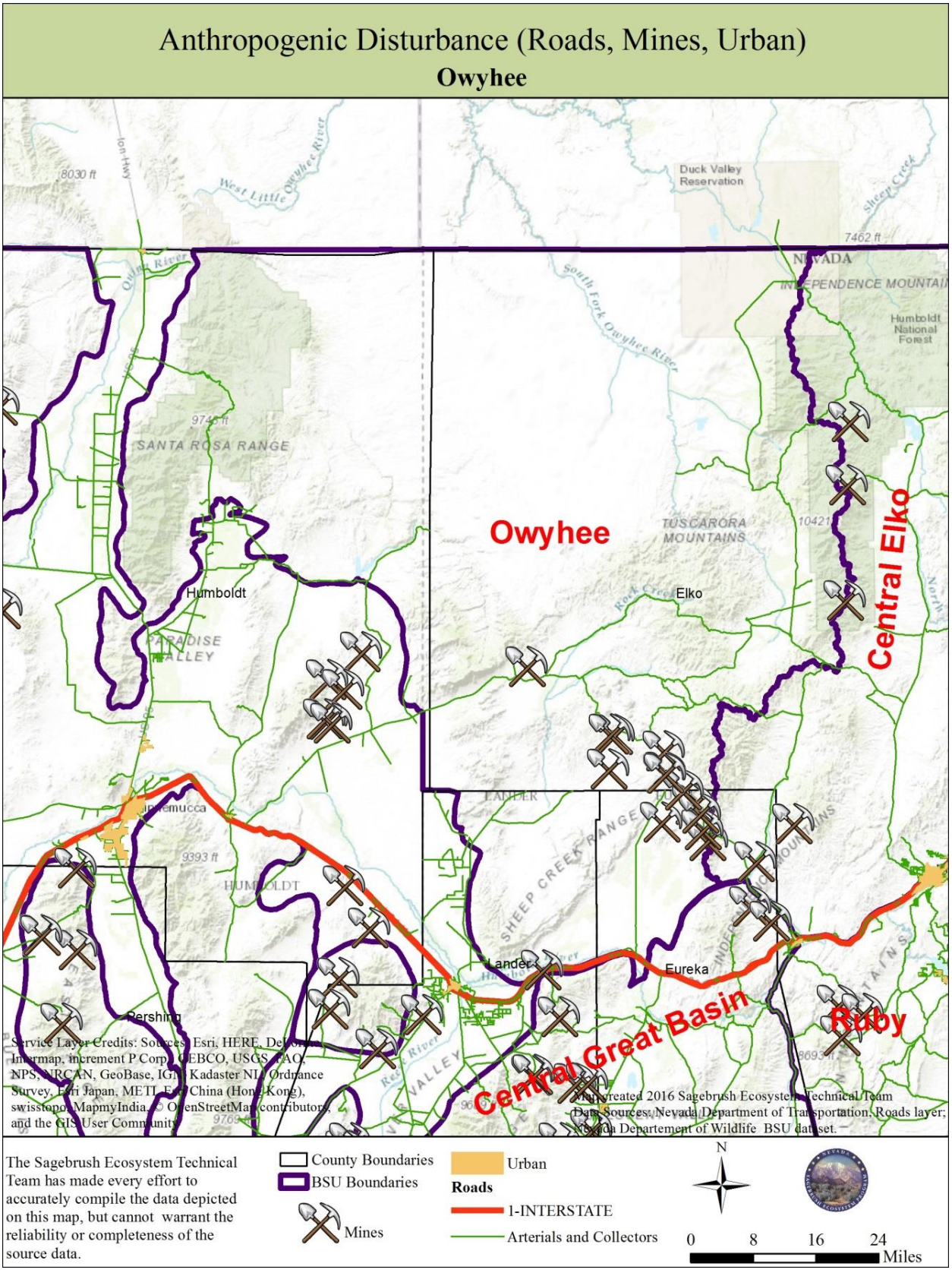
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 5 10 15
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Owyhee
Owyhee
Central Elko
Central Great Basin
Ruby
Humboldt
Elko
Lander
Eureka
Pershing
Winnemucca
Duck Valley Reservation
Humboldt National Forest
SANTA ROSA RANGE
TUSCARORA MOUNTAINS
SHEEP CREEK RANGE
PARADISE VALLEY
HUMBOLDT
LANDER
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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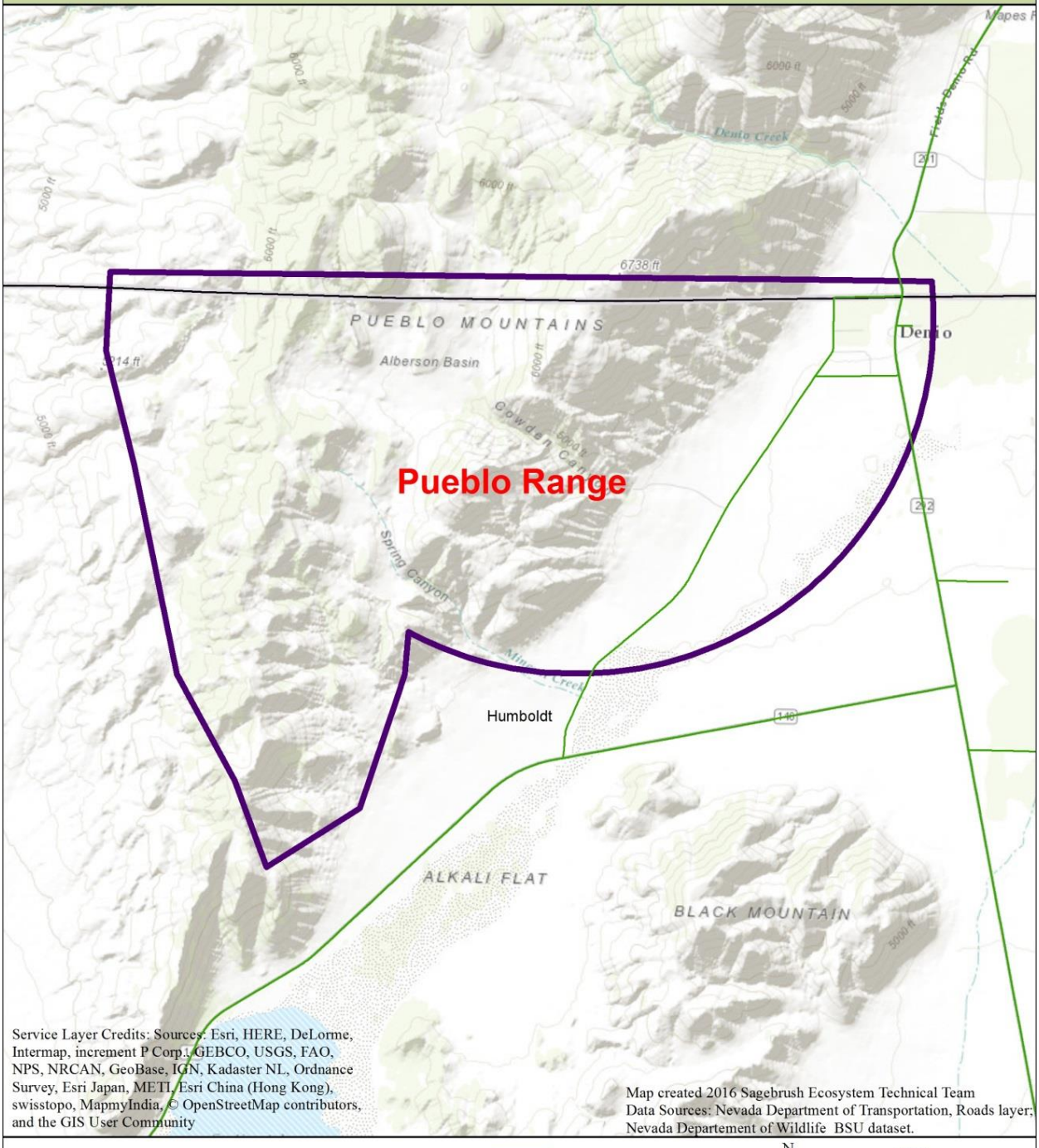
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 8 16 24
Miles

Anthropogenic Disturbance (Roads, Mines, Urban)

Pueblo Range



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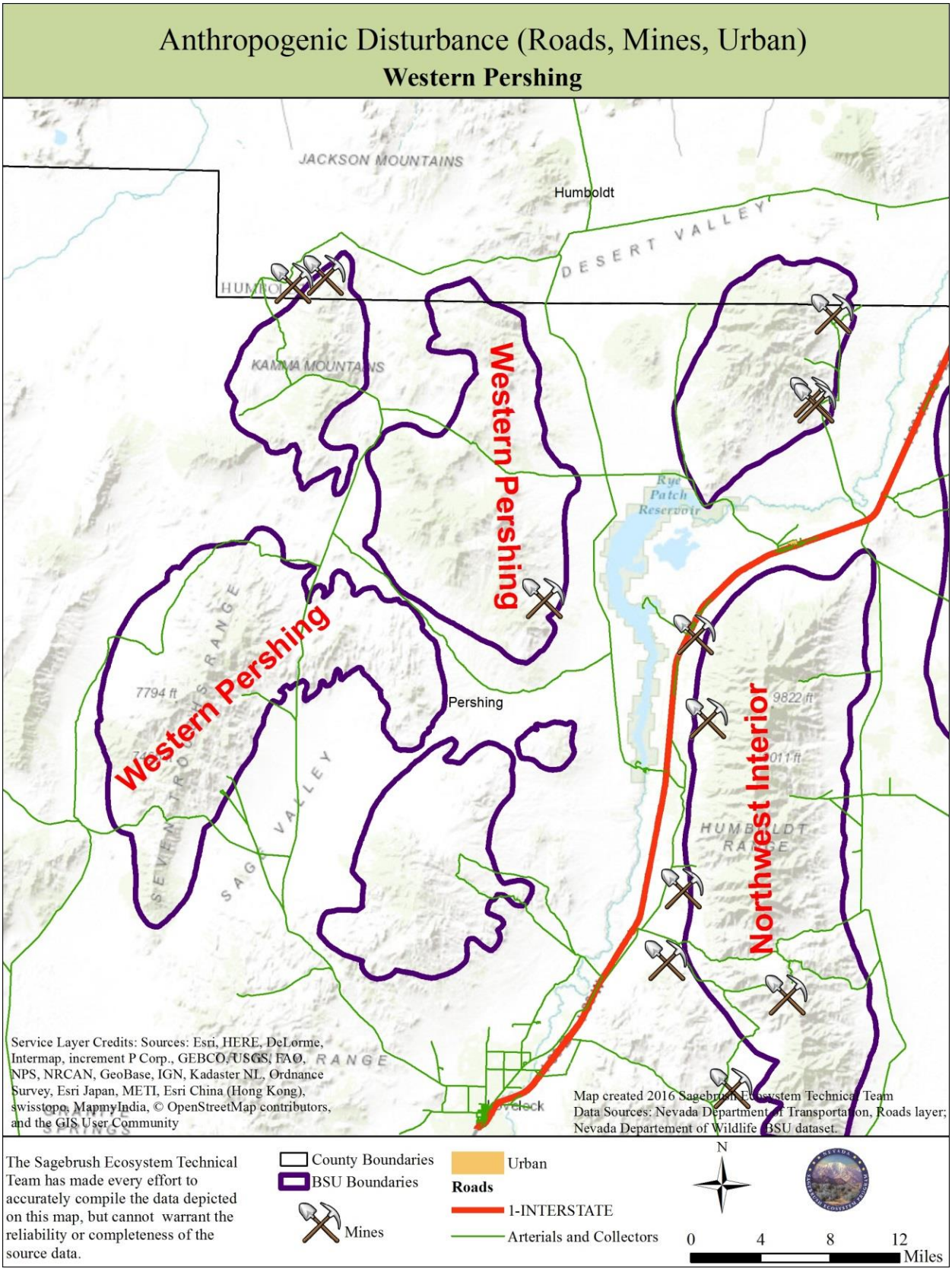
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors

N

0 0.5 1 1.5 Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Western Pershing
JACKSON MOUNTAINS
Humboldt
DESERT VALLEY
KAMMA MOUNTAINS
Western Pershing
Western Pershing
Rye Patch Reservoir
Pershing
7794 ft
9822 ft
SEVENTY TROUGH RANGE
SAGE VALLEY
HUMBOLDT RANGE
Northwest Interior
RANGE
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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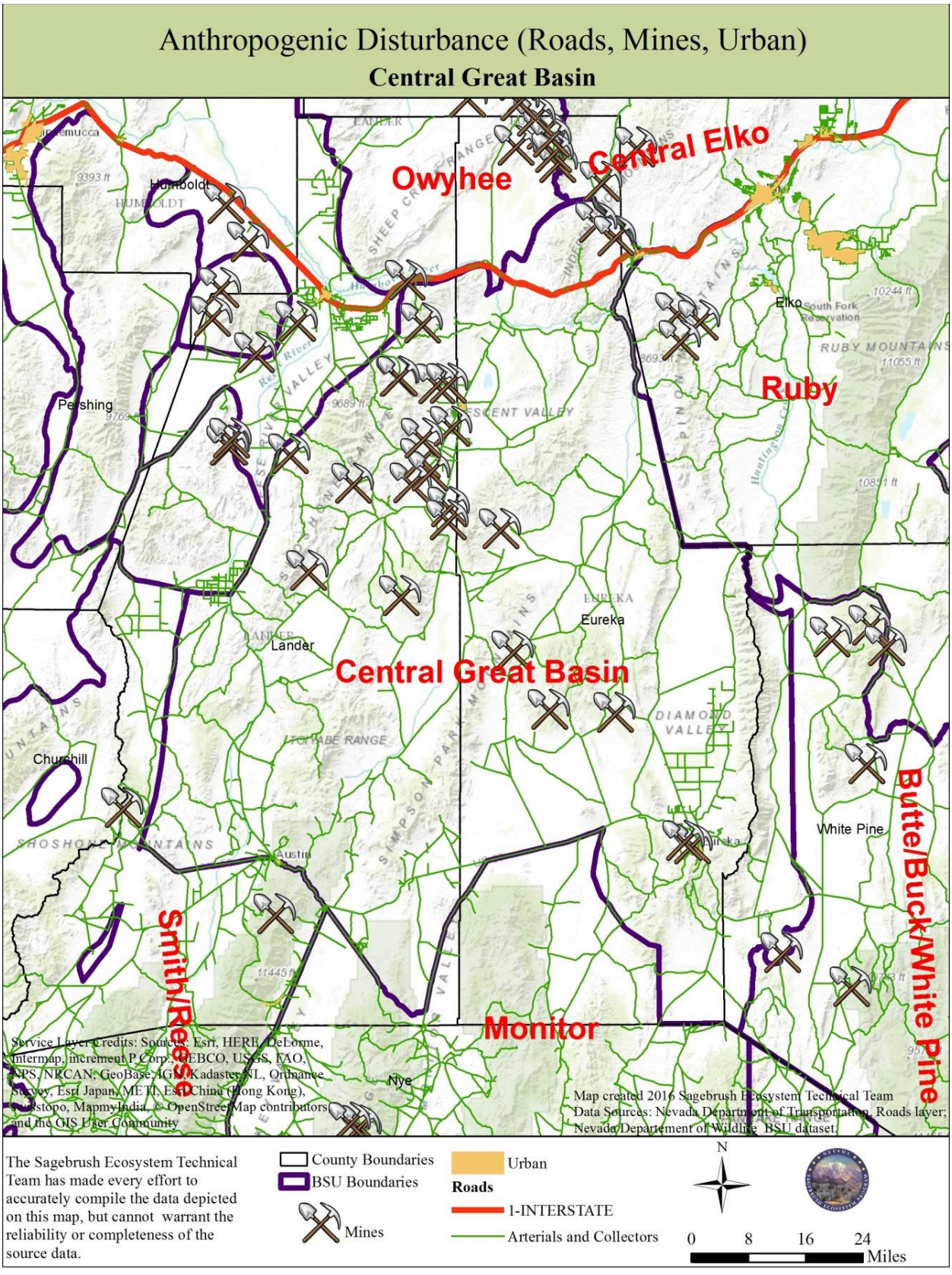
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 4 8 12
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Central Great Basin
Owyhee
Central Elko
Ruby
Central Great Basin
Monitor
Smith/Reese
Butte/Buck/White Pine
Humboldt
Pershing
Lander
Eureka
Churchill
Austin
White Pine
Nye
Elko
Service Layer Credits: Sources: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
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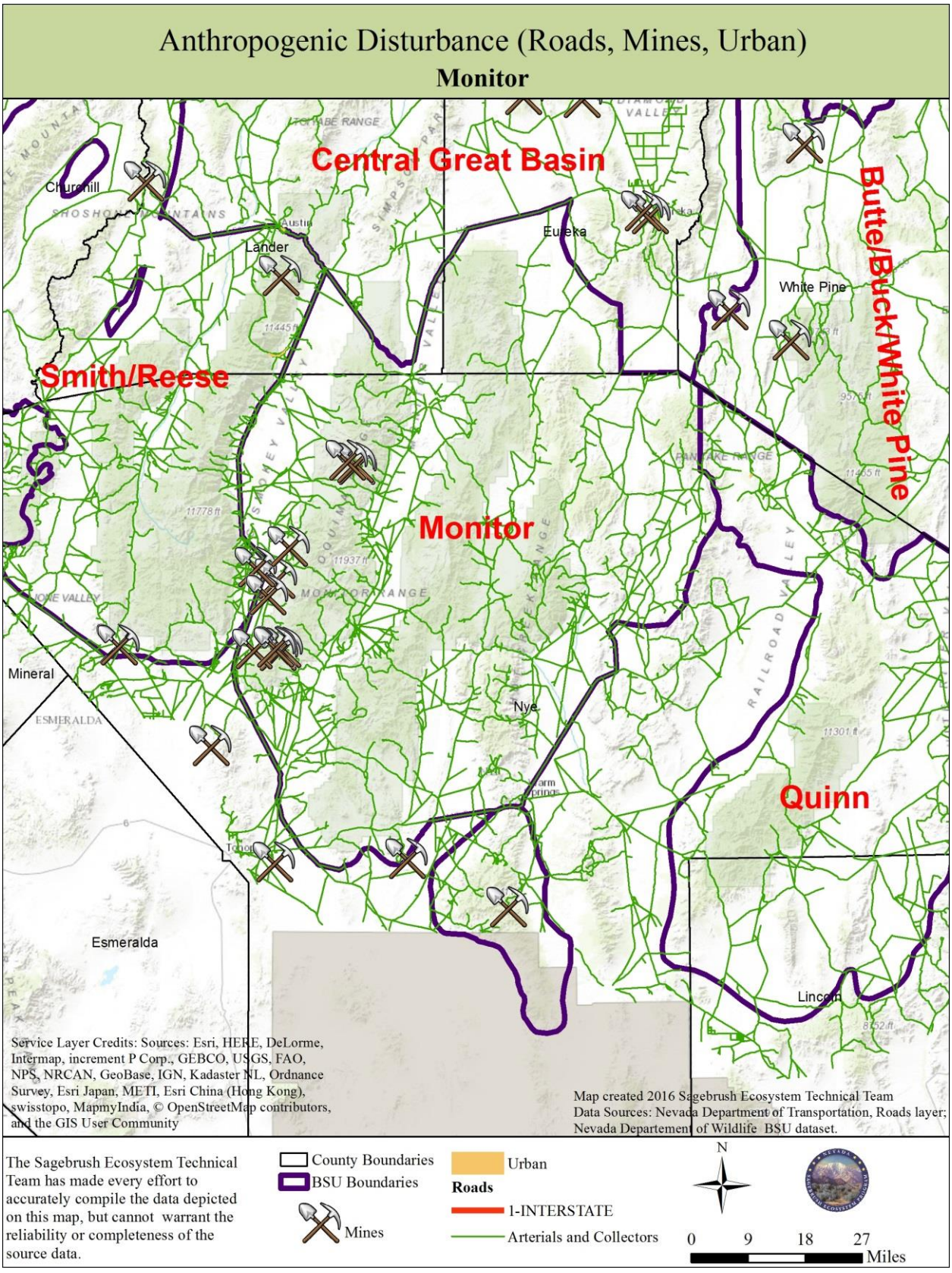
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 8 16 24
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Monitor
Central Great Basin
Smith/Reese
Monitor
Butte/Buck/White Pine
Quinn
Churchill
Lander
Austin
Eureka
White Pine
Mineral
Nye
Esmeralda
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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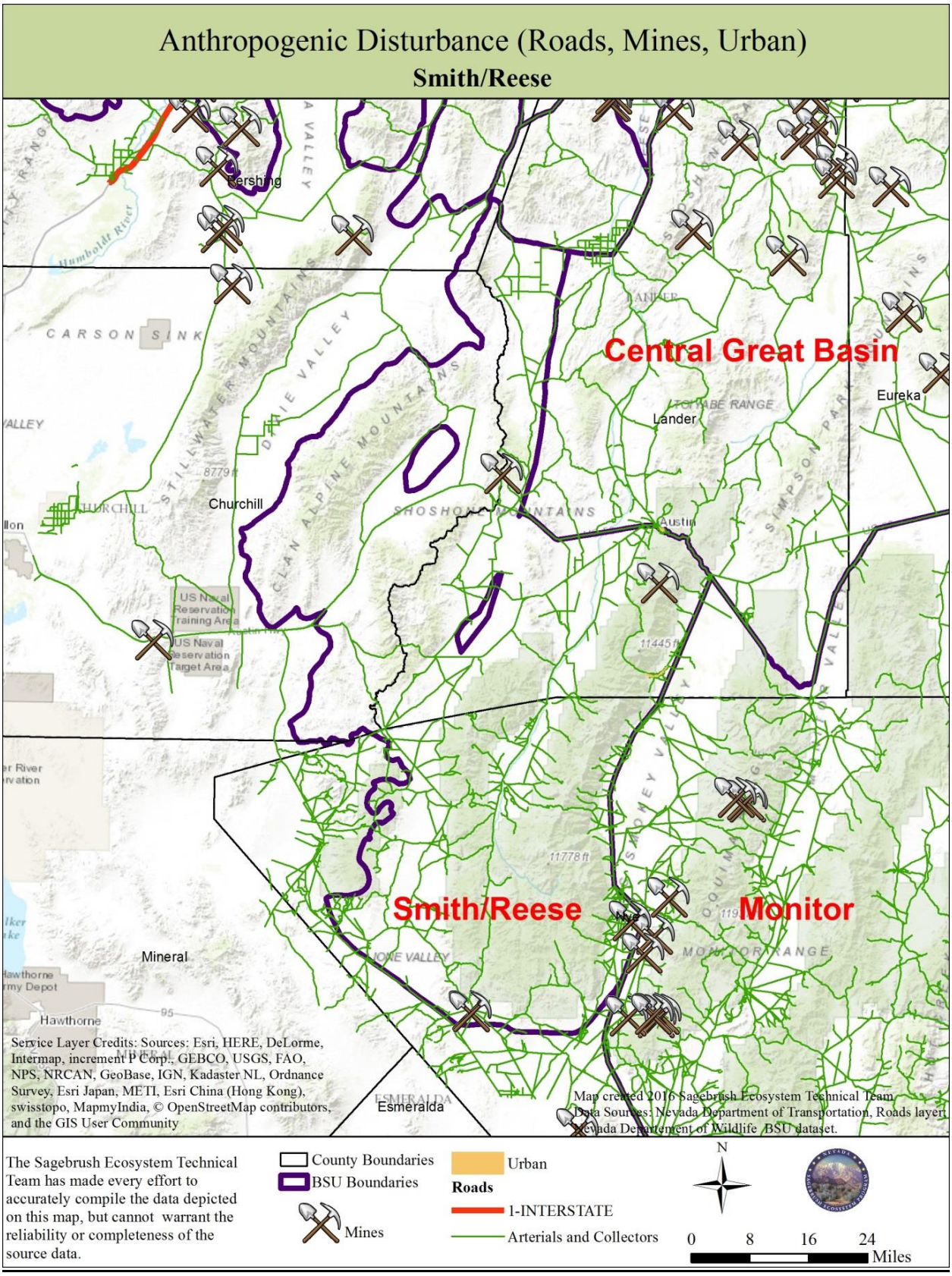
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 9 18 27
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Smith/Reese
Central Great Basin
Smith/Reese
Monitor
Lander
Eureka
Churchill
Austin
Mineral
Hawthorne
Esmeralda
Pershing
CARSON SINK
Humboldt River
US Naval Reservation Training Area
US Naval Reservation Target Area
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Map created 2016 Sagebrush Ecosystem Technical Team
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Nevada Department of Wildlife, BSU dataset.
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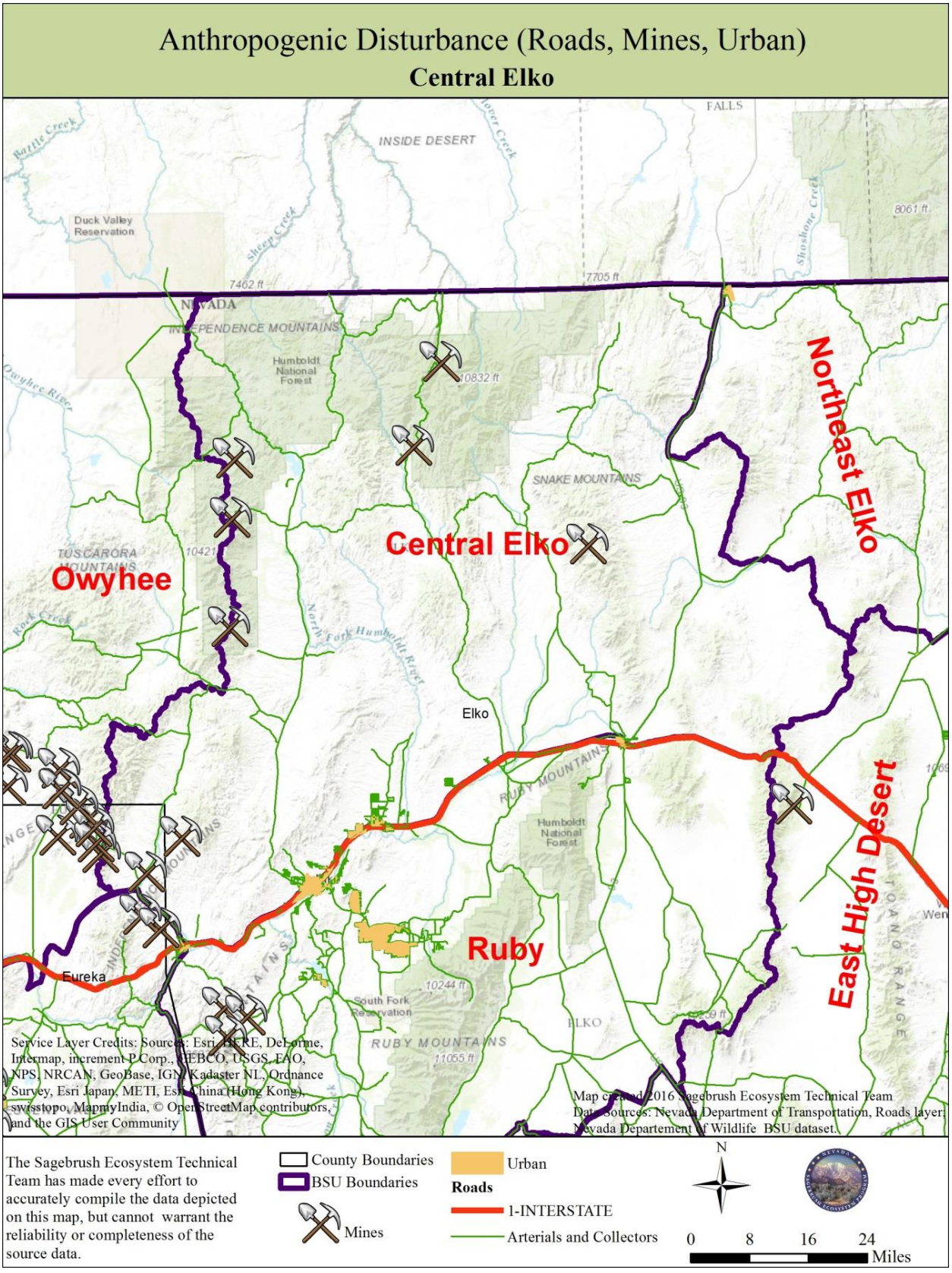
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 8 16 24
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Central Elko
Owyhee
Central Elko
Northeast Elko
East High Desert
Ruby
Elko
Eureka
INSIDE DESERT
SNAKE MOUNTAINS
RUBY MOUNTAINS
Humboldt National Forest
Duck Valley Reservation
South Fork Reservation
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., NEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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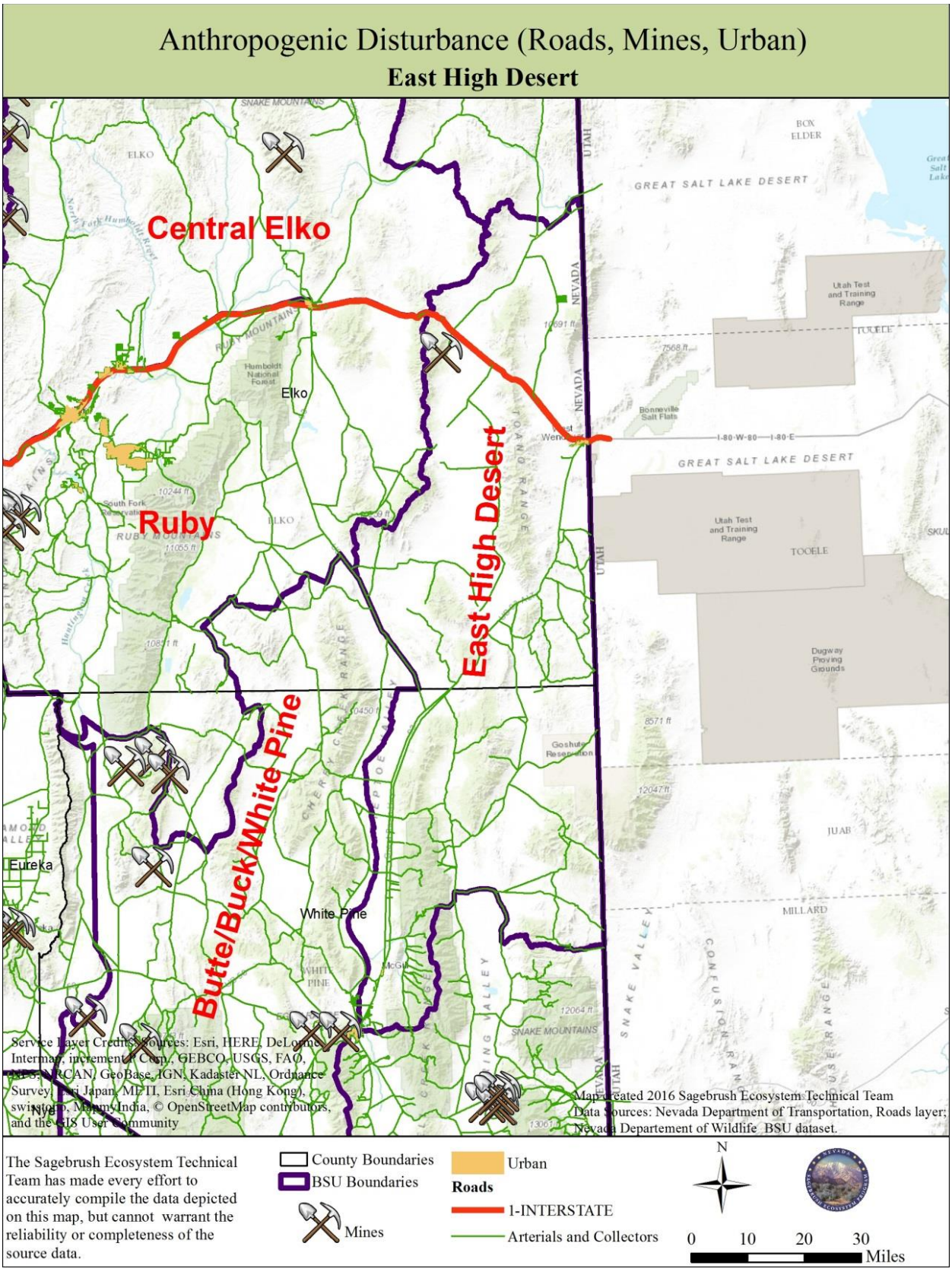
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 8 16 24
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
East High Desert
Central Elko
Ruby
East High Desert
Butte/Buck/White Pine
Elko
Eureka
White Pine
Nye
GREAT SALT LAKE DESERT
Utah Test and Training Range
TOOELE
Dugway Proving Grounds
Bonneville Salt Flats
I-80-W-80 I-80-E
Goshute Reservation
MILLARD
JUAB
SNAKE MOUNTAINS
SNAKE VALLEY
CONFUSION RANGE
NEVADA
UTAH
BOX ELDER
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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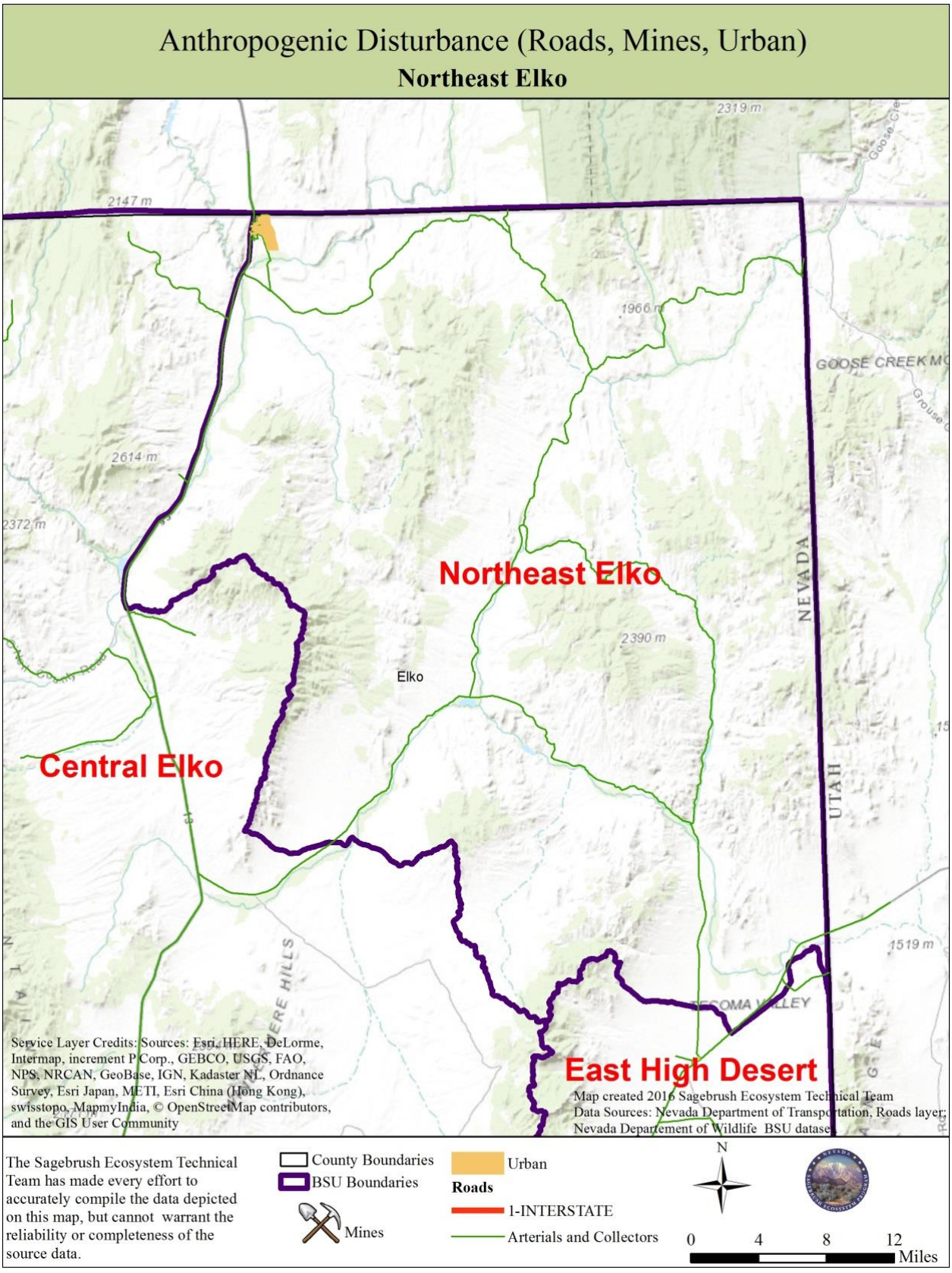
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Northeast Elko
2319 m
2147 m
1966 m
GOOSE CREEK MO
2614 m
2372 m
Northeast Elko
2390 m
Elko
NEVADA
UTAH
Central Elko
1519 m
East High Desert
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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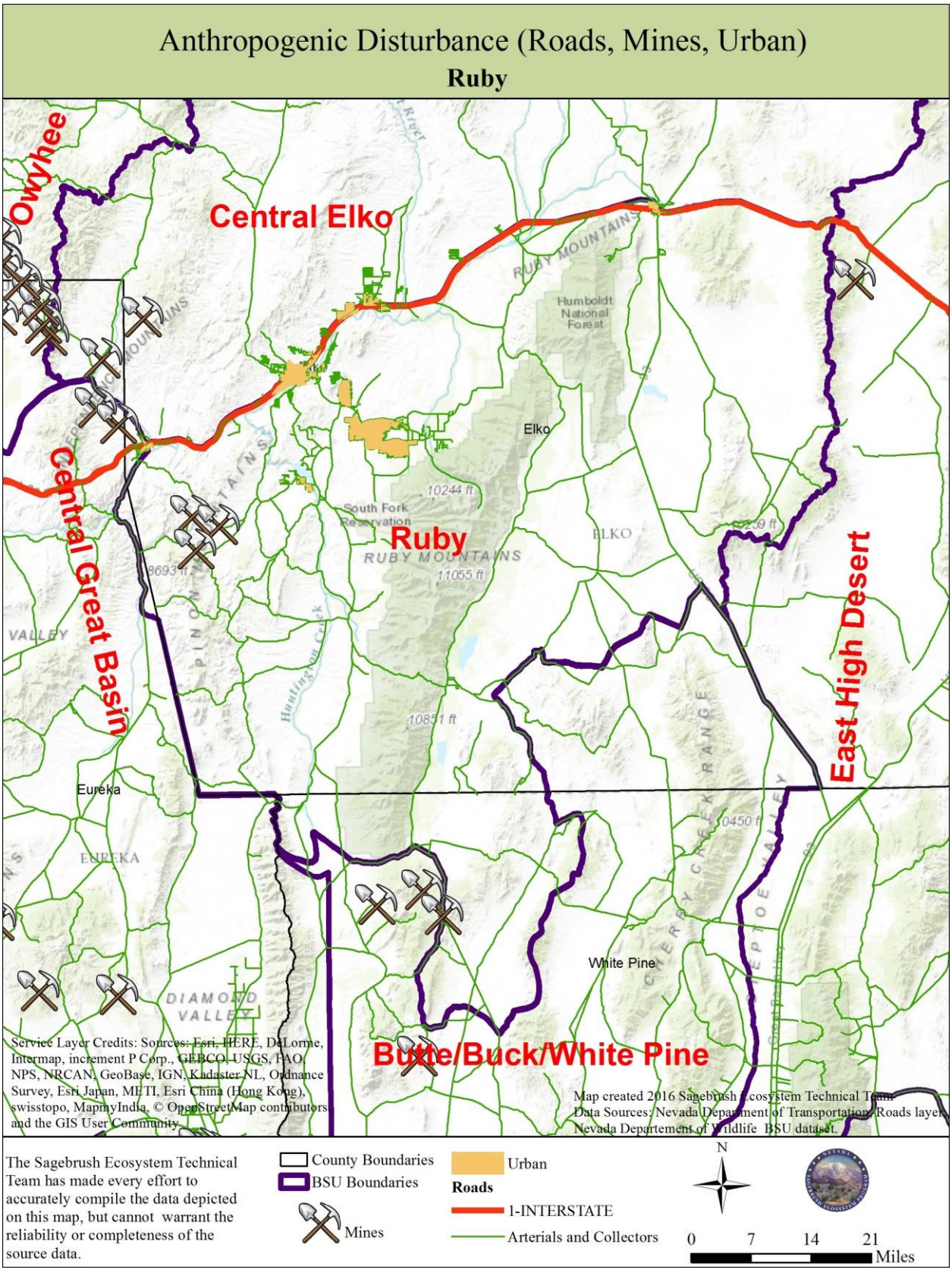
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 4 8 12
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Ruby
Owyhee
Central Elko
Central Great Basin
Ruby
East High Desert
Butte/Buck/White Pine
Elko
Eureka
White Pine
Humboldt National Forest
RUBY MOUNTAINS
South Fork Reservation
ELKO
EUREKA
DIAMOND VALLEY
CLEVELAND CREEK RANGE
10244 ft
11055 ft
10851 ft
10450 ft
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors and the GIS User Community
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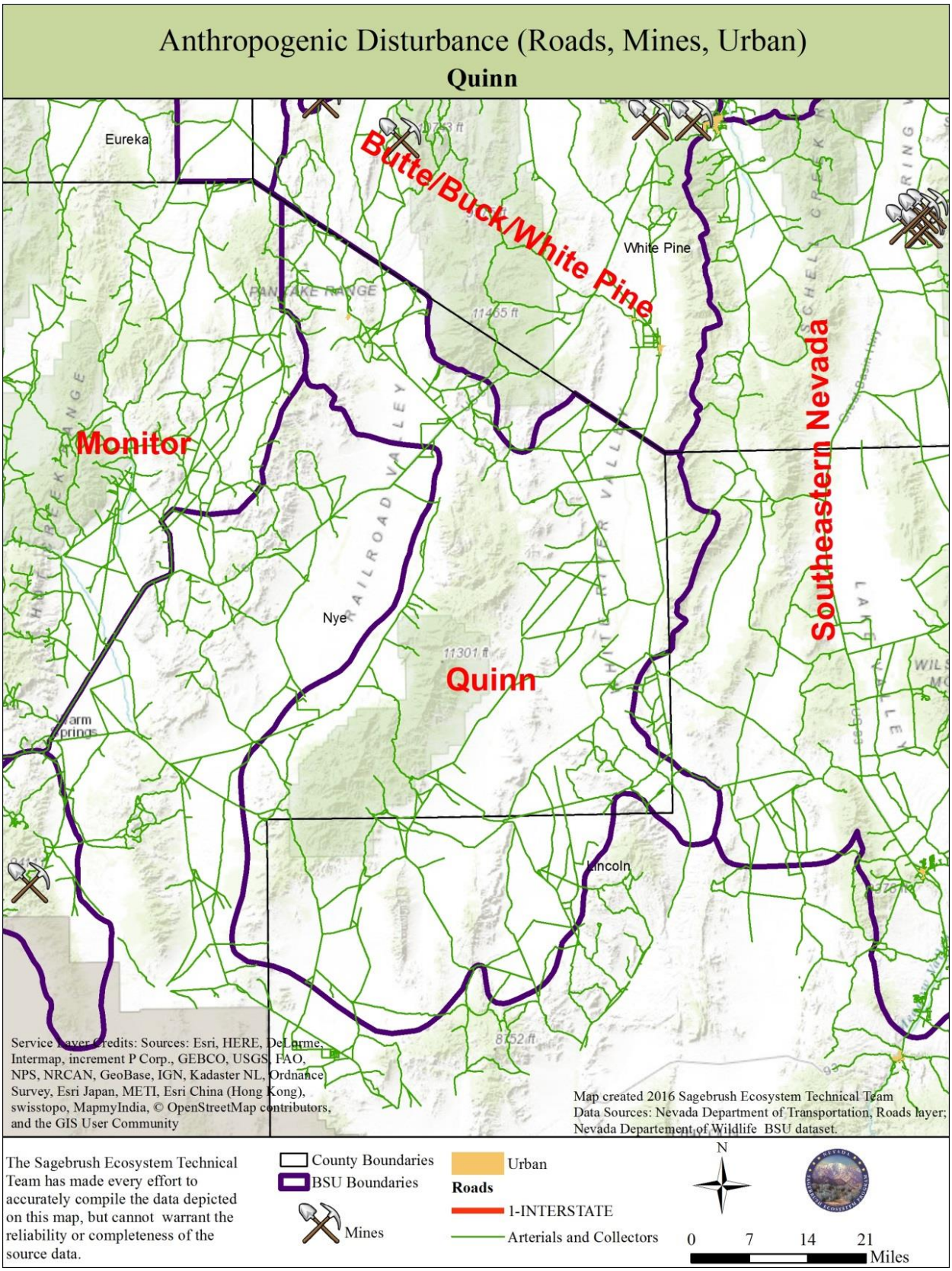
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 7 14 21
Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Quinn
Eureka
Butte/Buck/White Pine
White Pine
Monitor
Nye
Quinn
Southeastern Nevada
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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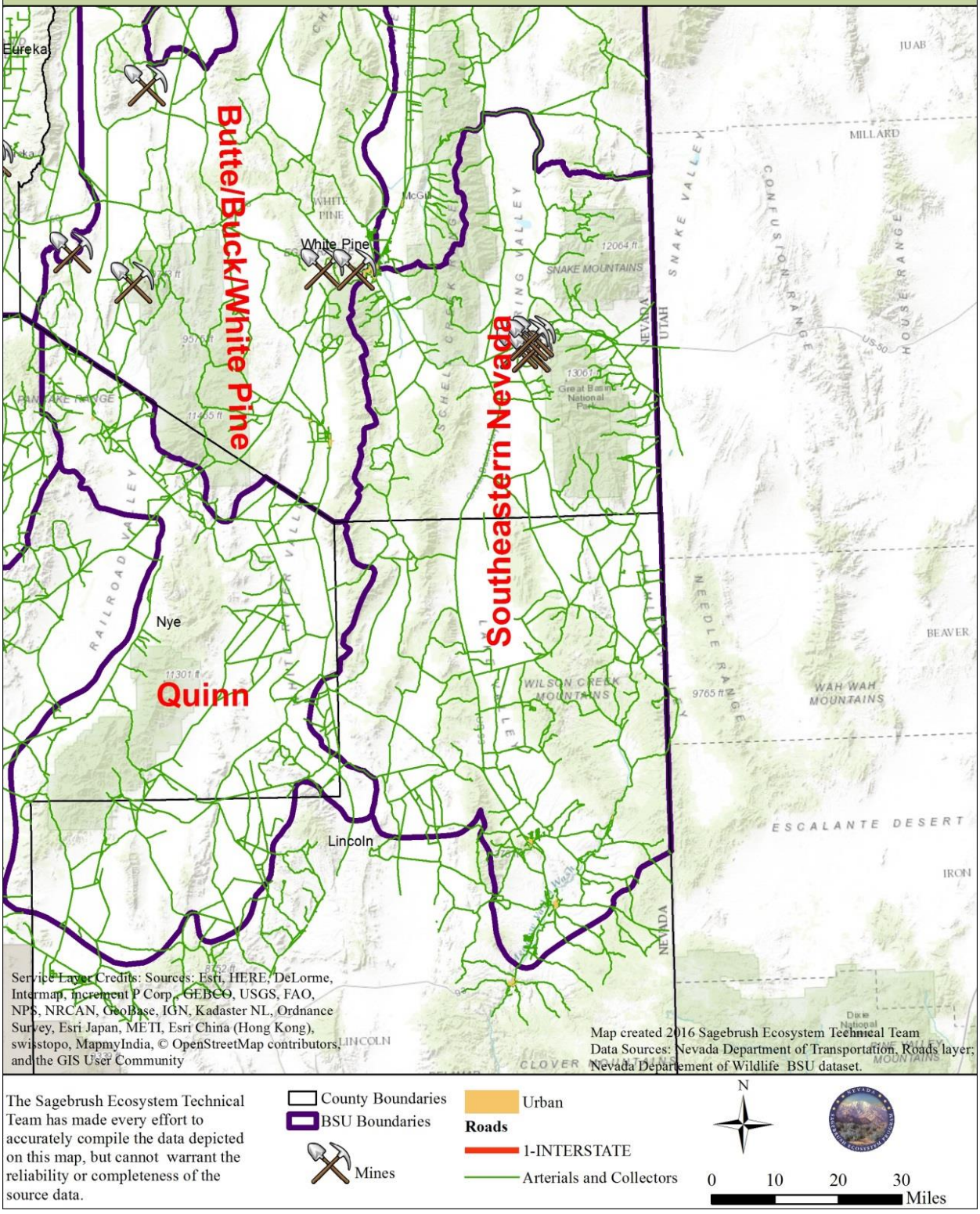
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 7 14 21
Miles

Anthropogenic Disturbance (Roads, Mines, Urban)

Southeastern Nevada



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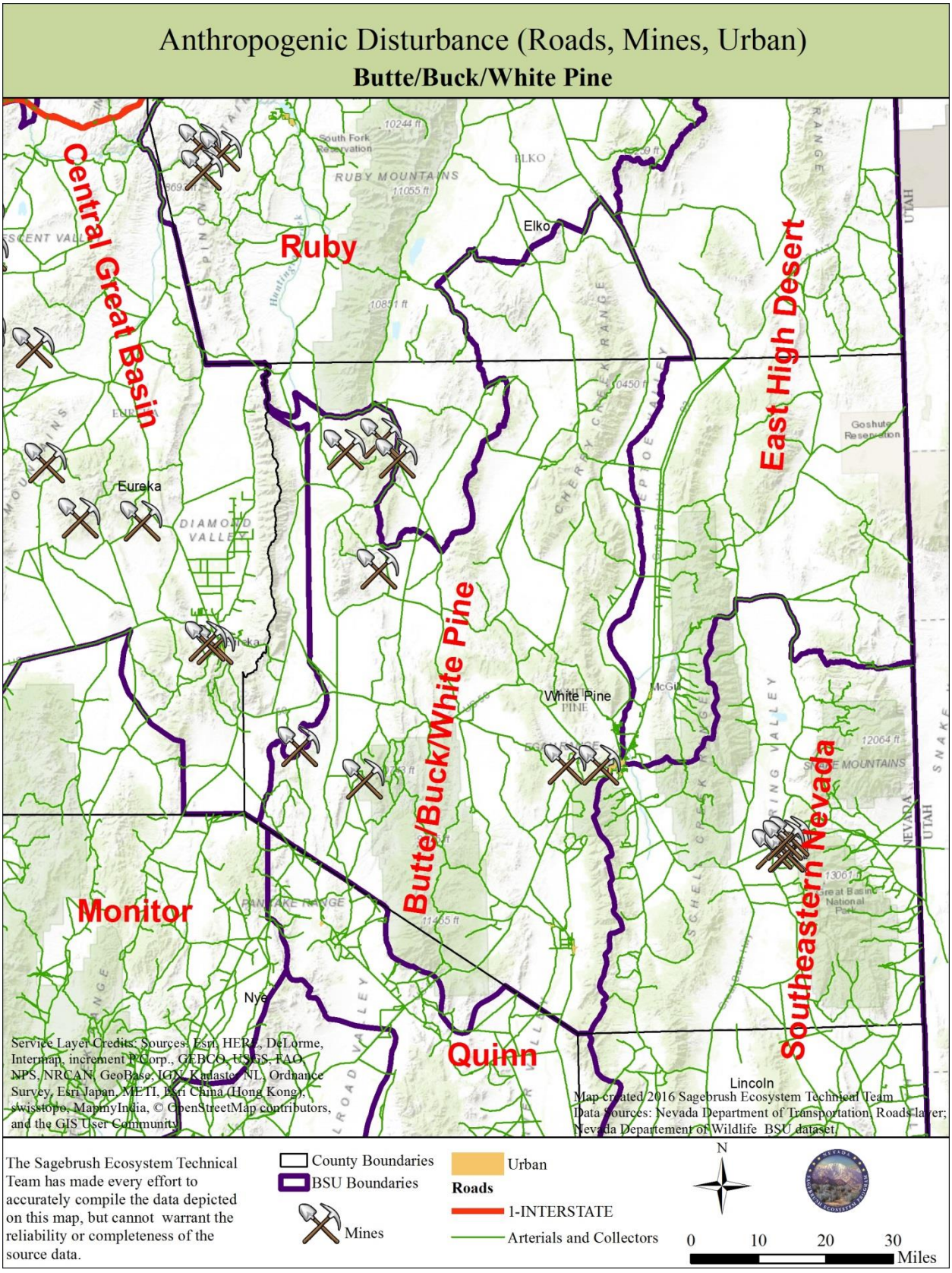
County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors

N

0 10 20 30 Miles


Anthropogenic Disturbance (Roads, Mines, Urban)
Butte/Buck/White Pine
Central Great Basin
Ruby
East High Desert
Butte/Buck/White Pine
Southeastern Nevada
Monitor
Quinn
Elko
Eureka
White Pine
Nye
Lincoln
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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County Boundaries
BSU Boundaries
Mines
Urban
Roads
1-INTERSTATE
Arterials and Collectors
N
0 10 20 30
Miles